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THE REMAKING OF MODERN ARMIES

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TO

THE RIGHT HON. VISCOUNT BURNHAM

G.C.M.G., C.H.

WHOSE VISION AND TIRELESS EFFORTS

HAVE GREATLY SERVED

THE CAUSE OF

IMPERIAL UNITY AND IMPERIAL SECURITY

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THE REMAKING OF MODERN ARMIES

BY CAPTAIN B. H. LIDDELL HART

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BOSTON
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PREFACE

THE keynote of this book is MOBILITY—of movement, action, organisation, and, not least, of thought. For mobility of thought implies originality in conception and surprise in execution, two essential qualities which have been the hall-mark of the Great Captains, distinguishing the artists from the artisans of warfare. As a motto for my theme therein I would take Napoleon's maxim: "The strength of an army, like the quantity of motion in mechanics, is estimated by the mass multiplied by the velocity." Armies to-day have become mass minus velocity—there is urgent need of research for the causes of this stagnant condition and for the speedy application of a remedy. Otherwise the outbreak of another war will doom us to a repetition, but more complete, of the paralysis of the last war, ruinous alike to the human and economic strength of the nation.

The pacifist might be disposed to welcome such a condition, holding that if armies are incapable of offensive action, offensive war is also impossible. He might thus argue for the maintenance of armies in this present state on the ground that, with their teeth drawn but their mass remaining, they ensure the defence of a country but cannot lend themselves to aggression against another country.

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In adopting this argument he would delude himself. Armies merely capable of defence are only a useless channel of expenditure when the power of offence is lost. For if an enemy realises that land attack is powerless, he will concentrate all his efforts in a more hopeful channel, such as the air. Land defence presupposes land attack; the one is futile unless the other is possible.

The immobility of modern armies has, moreover, graver consequences for the British Empire than for a self-contained and self-maintained country. Because of our widely scattered territory and widely extended frontiers the mobility of the armed forces is as much the basis of Imperial Defence as the mobility of transportation is the basis of Imperial Commerce. The emphasis on speed in warship design, like the development of a network of landing-grounds to give fluidity to our air-power, is witness to this cardinal truth—but it is not enough. The smaller our land forces the more essential is it that we should "multiply their mass by their velocity," and be able to concentrate them rapidly at any point on the land frontiers—as also in disturbed interior areas. Yet at present, when hostile tribesmen even are becoming possessed of modern firearms—with their paralysing effect—that velocity is declining as well as the mass.

A number of the studies which compose this book are founded upon articles of mine in The "Daily Telegraph," "Atlantic Monthly," "English Review," "Empire Review," "Army Quarterly," and "Fighting Forces," to whose

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editors I would offer acknowledgment. They are, however, recast and extended. Others are entirely new. All are selected or designed because they form a connected series of links in the argument for a revival of mobility. Like a moving pavement, this argument is composed of parts having a varying rate of motion. Thus Part I, the most rapid, is the level to which we must ascend and on which we can alone cover the main part of the journey to our destination. In the first chapter I have sought to establish clearly the primary cause of the siege-warfare stalemate which characterised the last war, passing on to show that release is impossible, and the present training for mobile warfare only self-delusion, until armies are not merely renovated but reborn. The second chapter is a survey of the ingredients from which a cure for the paralysis can be compounded. The third chapter, turning from the Home Army to the overseas forces, is an exposure of the futility of the present means of defence maintained in the Dominions, and a suggestion, based on an examination of their several problems, of how they might obtain an adequate insurance policy for the premium they at present pay towards defence. With the fourth chapter, thought is launched into the future, but a future close at hand, and with a secure anchorage in historical experience. An historical survey shows not only the decisiveness of cavalry in the past and the impossibility of it in the present, but the necessity for it in all times, and in an historical parallel between August 9,

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878, and August 8, 1918, we see a portent which foretells the rebirth of cavalry. Similarly, the next chapter is not merely an account of the last-invented weapon of war, but a deduction from history of its use in recreating the lost offensive-power of infantry. Thence, passing from the projector to the projectile, we study the rebirth of the bullet in an invisible and omnipresent form, exposing the fallacies which underlie the denunciations of gas and the popular idea that science has increased the horrors of warfare. Finally, we turn from the instruments to the object, from weapons to their target, and seek to explode another and graver fallacy, one which springs from Napoleon but was fostered by his military disciples rather than by the master himself. Only by recognition of the true object of war and the rebirth of its objective can the ravages of war be restricted and the "impassioned drama" be brought under the control of reason.

In Part II we descend to a plane of slower and more limited motion, yet one which is a necessary supplement to the other and a means of helping the transition. Even when armies are fully mechanised, it will still be necessary in some places for some proportion of men to fight on foot, and there is then both a present and a permanent value in developing this mobility. Part II is therefore a study of certain means of rejuvenating the existing forces. Chapter VIII is an argument for the replacement of the rifle by the automatic rifle not merely as an increase of firepower, but as an aid to tactical mobility and

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manœuvre. In Chapter IX we turn from action to the basis of action, showing that the present parade-drill is really a meaningless continuation of the battle movements of the days of the "thin red line," and suggesting reforms which might not only quicken the mobility of infantry but save many profitless hours in training. Such a reform is especially important for a citizen soldier, whose time is limited, and this consideration leads on, in Chapter X, to a study of the general problems of training the Territorial Army, whose training needs to be directed in the light of its purpose. The underlying purpose is as a basis of national expansion in the event of another great war, and the production of a body of trained leaders and instructors, therefore, dominates all other aspects of the problem. Such an inquiry naturally raises the greater question of leadership in the Army as a whole, and we are confronted with the problem why modern armies, despite their technical development, have shown a decline in the art of generalship and an absence of great captains. Is the study of war worthless? Can we only learn by the hard knocks of experience instead of, as Bismarck preferred, at the expense of others? Is the untrained amateur equal to, or better than the long-apprenticed soldier? If machine guns are the primary cause of the stagnant course of recent wars, is there a deeper cause in the modern system of promotion to command? The inquiry into these questions, lighted by history and logic, yields results which upset many accepted ideas,

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if they revive the psychological and historical truth that "youth is surprise and surprise is war." Part II closes with a chapter on Economy in the Army, which emphasises an additional factor in cramping the development of leadership.

With Part III we cross the Channel and study the reaction of the French and German Armies to these modern problems within the limits allowed by the peace and their purse. Their condition and outlook are so closely connected with the proposals for disarmament that a chapter is devoted to the elucidation of the fundamental differences of view on this subject. When Part III has been read, its title should need no explanation.

Part IV is purely retrospective; the chapter on the origins of the tanks is inserted because of its bearing on the theme of the book, and the last chapter because by reawakening memories of the last war it may help to stimulate concern over the depressing prospect that the long-drawn-out character of that struggle may be repeated hereafter.

For if the keynote of this book is mobility, its moral is that nothing less than rebirth can revive mobility in armies and in warfare. And without mobility an army is but a corpse—awaiting burial in a trench. Endowed anew with mobility through armour and mechanisation, armies may still play a great rôle. But if their leaders fail to realise that in their present state they are moribund, the taxpayer may be found insisting on their disbandment—to save, at least, the funeral expenses.

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PART I

REBIRTH

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CHAPTER I

THE ARMY OF A NIGHTMARE

A NIGHTMARE is defined by the dictionaries as a dreadful dream in which the sleeper is weighed down by a sense of oppression and helplessness, and its cause is usually ascribed to the stomach being overloaded through supping "not wisely, but too well." This definition aptly describes the dominant feelings of those who study the history of the war of 1914–18—the impression of an overpowering weight of numbers under which the art of the Great Captains was suffocated, and of the helplessness of the combatants to break loose from the fetters of trench warfare. In a different sphere and manner, the same "nightmare" sensations of oppression and helplessness have filled the minds of many who have watched or taken part in the training of the Army at home since the war.

The similarity of sensation leads one to search for the connection, for if this can be established and its cause discovered, warfare may be freed from the incubus which has clogged its course in recent generations, its old lightness and mobility restored. A survey of military history reveals that mobility has yielded to stagnation whenever the means of defence have acquired a material preponderance over the means of offence. A closer analysis of the last century shows also

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an ever-increasing paralysis of mobility, and of generalship as an art, in proportion as armies grew larger and as the means of fire-power were developed, especially the machine gun. It will remain one of the curiosities of history that only one student of war, a Polish banker, M. Bloch, foresaw the inevitable consequences of this drift —the trench deadlock which came about in the autumn of 1914. Perhaps the reason was that most of the distinguished military students of war were so occupied in trying to discover the secret of Napoleon's system, in order to apply it on the battlefields of the future, that they forgot to keep an eye on the changes in material conditions which would render void their application. Perhaps also the film of change passed so slowly before their faces, because of the retarding influence of conservatism, that it was not easy to realise that the picture had altered.

In " My Army Life " Lord Dundonald recently disclosed that he was aroused in 1884 to the value of machine guns by the direct experience of being charged by the Mahdi's spearmen at Abu Klea. And in a reply to a letter of his, Colonel Knollys, a military writer of the time, says: " Machine guns seem to be undervalued by the military authorities. . . . Lord Wolseley, I know, is personally a believer in machine guns, or as it may be termed, concentrated essence of infantry." Significant words—not only because they epitomise the value and motive of the machine gun as we understand it to-day, but because they show the difficulty of even a great

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reformer, and he, moreover, with the powers of a Commander-in-Chief, hastening the sluggish course of military progress. Napoleon said that "in war it is *the man*, not men, who counts"; for a modern army we might paraphrase this by saying that "in peace it is *the system*, not the man, which counts." In 1884 a few enlightened thinkers could foresee that machine guns were "concentrated essence of infantry"; exactly thirty years later we went to war with two in each battalion. So little was learnt in thirty years, even though the Russo-Japanese War cast a still deeper shadow athwart the future. The Germans appreciated the lesson a fraction, no more, better than the French and ourselves, but this fraction was enough to upset the balance of warfare, and tilt it downwards to rest, and long remain, in the slough of a trench stalemate. The machine gun's domination of the trench battlefields of the Western Front was universally, if tardily, recognised. It is true that ultimately, when the whole manufacturing resources of nations had been devoted to the production of munitions, a tremendous artillery bombardment could sometimes quell the defending machine guns sufficiently for the infantry to make a bound forward, at heavy cost. But the heaviest artillery bombardment could never suppress the menace—always as the barrage lifted some enemy machine gunners would emerge from dug-outs or open fire from shell-holes, and even a solitary machine gun would prove its power to hold up a whole infantry battalion, even a brigade.

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Later the tanks, when at last developed, cut a path for the infantry more economically and with better effect; but although themselves invulnerable to machine gun fire, they could not altogether crush these deadly scorpions of the battlefield, some of whom survived to take toll of the vulnerable infantry who followed the tanks. The tanks could even capture a position, but the traditional procession of infantry had to make the sacrificial offering to ensure the omens of victory.

After the war the military authorities said: "Trench warfare is finished with; we shall train for moving warfare." A most admirable sentiment, for trench warfare was inevitably the negation of generalship, the triumph of mud over mind. But as trench warfare had been created by the machine gun and barbed wire, two paralysing agents which the tank had been developed to cure, and as tanks formed but a tiny fraction of the reconstructed armies, it is a little difficult to understand the grounds for this belief in a revival of moving warfare. So strange are the processes of thought that some of the leaders who were most anxious to restore mobility seemed also the most averse by instinct to the one means which could gratify their desire. This paradoxical attitude was even held by commanders who had stood out in the war as men possessed of the real flair for generalship, who with accustomed instruments had revealed by quick and sure action that, like the great captains of the past, they were imbued with the

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principle of mobility. Thus in 1925 I was told confidently that the scheme of tank-proof localities had nullified the menace of the tank—until the tanks surmounted and penetrated these chosen localities as a proof to the contrary. Then the split trail for field guns was announced as the antidote—disillusionment came when I saw anti-tank shoots at Larkhill and found from the analysis of five separate shoots that the average was 1 hit in 22 rounds! If this was the case when firing under tranquil conditions, at one or two slow-moving and deliberately manœuvred dummy tanks, it was not difficult to estimate the decrease of effect when, as in the war, the tank's direction of approach was uncertain, when the target was a swarm of tanks in a swift nerve-shattering onrush, and when the target was simultaneously pouring a hail of fire at the gunners. In naval gunnery practice before the war about 75 per cent. of hits was registered; under war conditions this fell to 2½ per cent.! Such is the influence of nervous strain and other battle factors.

Later still we were told that the ·5-inch machine gun had sounded the death-knell of the tank; but after practical test there was a marked loss of assurance as to this latest patent remedy. This eager and ever-buoyant hope for an antidote to the tank comes curiously from the lips of soldiers who sincerely desire a return to moving warfare, wherein the art of command and the keen eye for an opening can again find scope. I wonder if they realise that the discovery of an

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antidote must quench all chance of a renaissance of mobility and doom us to a perpetual reign of machine-made slaughter. And if so, the professional soldier will be subordinated to the " big business " organiser.

If the tank should be laid low, the machine gun would be left undisputed master of the battlefield, and the possibility of attack decay and perish before an immovable defence. For if the vast artillery bombardments of the war could not subdue the machine gun, there is no hope that we could succeed with our present slender scale of artillery, whose effect is still further diminished by the greater difficulties of observation and registration in open warfare as compared with the static conditions of 1914–18. Only one conclusion can be drawn from this last fact—that with our present proportion of artillery there is no chance of infantry advancing in normal country against an enemy adequately equipped with machine guns. The alternative is a lavish use of tanks ; but here, again, we have not a tithe of the machines required for such a purpose, even for our small expeditionary force of four divisions. And if we had, it would be wasteful folly to expend them in bolstering up an arm which is a debit rather than an asset on the balance-sheet of battle. Infantry can no longer conquer a position defended by hostile machine guns. They do not even hold it when conquered—as our official doctrine recognises when it lays down that the machine guns, with the artillery, are the framework of every defen-

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sive position. If it be said that I am stretching the term "framework" beyond the meaning intended by Field Service Regulations, I would reply that the strength of a building rests in its framework, not in the surface-covering of plaster.

The effective rôle of infantry is now limited to "mopping up" the ground that the tanks have conquered and to holding it, if possible, during the brief interval before the machine guns can be brought up. And with the development of the six-wheeled carrier even this transitory rôle disappears, for the machine gun can be rushed forward more quickly than the infantry. True, in certain abnormal country—woods or mountains—infantry on foot are still necessary and are still an effective offensive arm when the thickness of the cover gives them a protection they otherwise lack. But such ground is only a fraction of the land surface of either Europe or Asia, and it is surely irrational to base the composition and policy of our Army as a whole on the peculiar conditions of the North-west Frontier of India.

These truths were thrown into bold relief by the training of 1926, when by far the most convincing exercises were those of the divisions where, owing to strike duty, only a single infantry brigade was available, but where the tanks, artillery, and machine guns were on a scale hitherto employed for a whole division of three infantry brigades.

My belief is that the year 1926 will be in history a landmark in military evolution, and

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the cause lies in the invention of the cross-country six-wheeler. The one slender justification for preaching mobile warfare to an army with but a handful of tanks had lain in the immobility of the machine gun. If war had broken out, there was just a chance that, if operations could be kept fluid, the hostile machine guns might be slow in getting up or moving to cover the threatened spots on a wide front. But through the cross-country six-wheeler the machine gun has become mobile, and warfare, as a consequence, irredeemably static, unless and until our Army is fundamentally recast.

Painful and direct experience has engraved the power of the machine gun on the minds of soldiers, and it is easier to appreciate its effect when made mobile than it is to realise the menace of the tank, which few of our troops ever experienced as a weapon against themselves. In recent exercises, the tactical issue has turned nearly always on the action of the tanks, but the lesson is still obscured by the natural pride of the other arms, by the fact that we only possess a handful of tanks, by umpiring rules which have no relation to gunnery results or war experience: if a gun gets off two rounds at a tank within 600 yards and at 6 m.p.h., the tank is put out of action; if over 6 m.p.h., four rounds are necessary. The optimism of these rules is astonishing in the light of the anti-tank and naval gunnery statistics I have quoted earlier. Their existence, however, can still obscure the logical truths that armour plate is inherently a better protection

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than the human skin, that an engine is better motive power than a man's limited muscular energy, and that a mechanised "combatant" can carry an indefinitely more powerful armament than a man, who can only carry a rifle or part of a machine gun for a short distance. But every soldier with war experience knows too well the resisting power of machine guns; a moment's reflection on our present artillery and tank strengths will show him the hopelessness of an infantry attack in future against a position held by machine guns; and the knowledge that the machine gun has now been endowed with mobility will tell him that there is no longer a chance of finding an unguarded avenue on the hostile front which their machine guns cannot close more quickly than our own infantry can reach it.

Let it be remembered also that the "stupendous" German machine-gun strength of the war only reached 142 guns to a division at its peak, in the winter of 1917–18. It was but a third of this figure at the time of our bloody repulses on the Somme. What if the German Command, when it adopted a defensive rôle on the Western Front, had been inspired with sufficient originality to convert the majority of these "defensive" divisions from an infantry to a machine-gun basis—revolution instead of slow evolution—retaining in them only a small proportion of light infantry as scouts and skirmishers. If our infantry could not break through a divisional front held by 142 machine guns, could they ever have hoped to make an impression on a divisional

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front composed of 1,400–2,000 machine guns? The question has only to be asked for us to realise that our constant checks would have become checkmate.

From the past let us turn to the present and future. If the machine gun is master of the modern battlefield—in the absence of tanks—and infantry makes so limited a contribution to the military object, why do we retain 136 infantry battalions to only 4 tank battalions, 2,176 infantry platoons to only 136 machine-gun platoons? Rationally, there is no answer, and we stand convicted of spending some £40,000,000 a year on an army the bulk of which gives neither offensive nor defensive value in return. Practically there are several excuses, and it is just to examine them.

First, the fact that the authorities now in power are burdened with the legacy of their predecessors. I cannot feel that the historical verdict will be very favourable to those responsible for the reconstruction of the Army after the war. In 1918 the experience of the combatant was dominated by the machine gun, the tank, smoke, and gas. But the post-war rebuilders of the Army cried "Back to 1914," and reduced to a shadow equipment and training in all these new elements. Even with the machine gun, which could not be regarded as a trench-warfare novelty, this depreciation occurred—the Machine Gun Corps was "axed" and a mere platoon of eight guns was allotted to each battalion. The present authorities, faced with the task of restor-

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ing the true proportions, have a far greater handicap—because the opportunity of rebuilding on new foundations was lost. To modernise a structure that has once taken form is a Herculean labour under the pressure of financial stringency and vested interests. The second excuse, in fact, is that of vested interests—in the best sense of the phrase. If we converted most of our existing regiments into tank or mobile machine-gun units, we should not only need fewer men, but the increased expenditure on machines would have to be met by discharging the large surplus of men in order to apply the cost of their pay to a more practical object. We can fully understand the reluctance to cause this hardship, and we know too well the clamour that always arises when the pursuit of economy, even for greater efficiency, changes from an abstract ideal to a concrete demand on the individual. But as the whole is greater than the part, is it right to keep the security of the nation in jeopardy while the soldiers affected are slowly reconciling themselves to the inevitable?

A third excuse is the rapidity of mechanical progress, whereby the latest product of to-day is obsolete to-morrow. We have marked time for eight years now, and if we are to await mechanical finality we shall wait for all eternity. If the Navy had acted on this argument it would still be equipped with the wooden sailing-ships of Nelson's day. Faced with the certainty that our existing Army cannot advance against machine guns, except under exceptional con-

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ditions, the plea of "experiment before production" rings hollow.

The best excuse, and the strongest obstacle, is the Cardwell system combined with the reluctance of the Indian authorities to accept any modern machines—whether tanks, dragons, or anti-aircraft artillery. The Cardwell system, which served a useful purpose in its day, is now obsolete, although venerated by many politicians who do not understand that its rules are like fetters riveted on the Army's "limbs." Although mechanical units could more effectively control the greater part of India, the Indian horizon seems to be limited to the North-west Frontier, despite the fact that any serious invasion would now assuredly come through Persia and Baluchistan, which are already practicable for the movement of a mechanised force. A way out of this *impasse* can only come either by a broadening of the Indian horizon or by an abandonment of the Cardwell system. It is a mockery that trained dragon-drivers, drawing tradesmen's rates of pay, should be drafted to horse-drawn units in India, there to forget their training and learn to drive horse teams, to their own discouragement and the nation's cost. While we recognise the difficulties which confront those who are responsible for the progress of the Army, and pray that they may be given strength and wisdom to attain their goal, the experience of war tells us that a clear view of the goal is an essential aid towards reaching it. Here, outside suggestions may at least help to focus the vision.

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On what pattern is the Army to be recast? Like an athlete who has run to fat, it must reduce its infantry corpulence and develop its mechanised sinews. In the light of their present restricted uses, we see that the proper rôle of infantry is that of land-marines; for the duties of "mopping up" and for hill and wood fighting a quarter of their present strength would be ample. The reduction would enhance their usefulness, for while we could never provide the transport to mechanise the present numbers, we could convey a proportion of land-marines as part of a mechanised force. At the moment we are trying to mechanise the transport of infantry in order to carry their weapons and equipment, and the sight of a string of fast cross-country motor vehicles crawling behind a 2–3 m.p.h. column on foot is as painful an anachronism as it is a pitiable waste of mobile vehicles. Nor does the harm end there, for so long as the infantry form the mass of the Army, and go on foot, so long will the Army be tied to the pace of the slowest foot-soldier. War experience and post-war exercises have established beyond doubt the senile decay of infantry in its traditional form.

When an employee is no longer able to perform his work, it is cheaper to pension him off at once and fill his place, than to retain him as a clog on the efficiency of others. By reducing the proportion of infantry, we could not only increase our tank strength, and hence our offensive power —at present negligible—but also increase our defensive power by converting the balance of

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the infantry into mobile machine-gun units and land-marines. The conversion has become immediately practicable through the practical success under test of the new six-wheeler, which is essentially a commercial product and so ensures a reserve for war expansion. Hitherto I have stood for evolution, but the mobile machine gun has stepped in to create revolution and to destroy the customary argument for "going slow."

The ultimate consequence is still more far-reaching. For as the infantry disappear before the present machine gun, so will this lose its own target, and value, but itself remaining a target for its own enemy, the tank, it must disappear—or, acquiring armoured protection, become a form of tank. Thus the result of the triumphs of the machine gun is to hasten the coming of tank armies. Improving upon the legendary phœnix, a newborn offensive power is rising from the ashes of the defensive overlord of the battlefield.

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CHAPTER II

THE CURE—MOBILITY

If it is clear that the indigestible mass of infantry is the cause of our military nightmare, and equally obvious that this must be reduced to secure immediate relief, it is no less clear that only by a change of diet can we ensure freedom from future trouble. This must be a lighter diet, which, translated into military terms, means a return to the mobility that has ever been the secret of the great *chefs de la guerre*. In the annals of warfare the periods when positions and sieges have filled the military menu are rightly regarded as marking a decline in the art of war. How few are to be found in the careers of Hannibal, Scipio, Napoleon, or Lee! To-day, the obstruction caused by the machine gun and by bloated conscript armies, too unwieldy for manœuvre, may be removed by the wise application of armour, the petrol engine, new means of concealment, and a reversion to highly trained professional forces. Thus may the overwhelming evidence of the defensive mastery of the machine gun pave the way, paradoxically, for an era of offensive mobility. In what measure are equipment and training keeping pace with this far-reaching strategical and tactical change, and what must be their trend in the immediate future? At the head of the list rightly comes

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the six-wheeled cross-country vehicle, for it is the astonishing performance, simplicity, and commercial scope of this machine which, by making the machine guns mobile, and their mechanisation an immediate possibility, have given infantry the *coup de grâce*. Although financial and political factors may delay the disposal of the corpse, there is little military value in making a post-mortem examination, and, for this reason, I do not propose to discuss the experimental use of the six-wheelers as first-line transport to foot-marching battalions. Their true value is to bridge the gulf between the muscle-moved armies of to-day and the tank armies of the ultimate future, and their cheapness combined with their cross-country performance make them a practicable stepping-stone. Thus they can serve as the means of movement of mobile machine-gun units and land-marines (late infantry). With these Morris six-wheelers both rear-axles are driven; the load is distributed and the pressure much less than that of the normal four-wheeler.

The distribution of load is important, because it enables what is otherwise an ordinary ton lorry to carry 30 cwt. on the roads, so that even for the commercial user at home it is a more economic purchase than the four-wheeled lorry. The reduction of pressure is still more important for military use, because it lessens the sinkage on soft ground—it is actually less than that of the hoof of a horse with rider. I have seen these vehicles carrying a complement of some ten men

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through the deep sand of the Long Valley at Aldershot and up the precipitous slopes of the surrounding heather-covered hills. Good as is the vehicle, the keynote of the design is of even greater promise, for it is being applied to larger vehicles with equal success—there are already several types of a " medium " vehicle which can carry three tons on the road and two tons across country. This mechanical keynote is the type of suspension, designed by the R.A.S.C. Experimental Branch, which keeps both pairs of driving wheels glued to the ground and ensures that the full tractive effort is not lost, as in earlier six-wheeled machines, when it is most needed, on soft ground. With all the advantages—economy, silence, speed—of a wheeled machine on roads or level ground, it can be converted into a half-track machine, when needed, by the rapid adjustment of a light track round the rear pairs of wheels. The scope of the larger vehicles is even more extensive than the existing ones, for not only will they serve for the general transport of an army, reducing the number of lorries and increasing their mobility, but they would seem ideal for use as armoured cars and for the artillery.

The six-wheeler has proved its practical worth, and there are sure grounds for beginning at once to convert part of the infantry surplus to mobile machine-gun units on this basis. But although this will greatly increase the defensive and delaying power of our Army, it does not solve the problem of augmenting an offensive power which

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at the moment is represented only by four tank battalions. We employed 456 tanks in the attack of August 8, 1918, when the machine was only two years old, yet the highest number seen in training operations since the war has been twenty-eight, and in most exercises no more than eight. Except in design and thought we have slipped back during the last eight years. It is absurd that in 1926 we should possess only four tank battalions, with a peace strength of only forty-eight fighting machines apiece, but it is more absurd that the actual strength should be barely half because of an inadequate supply of spare parts.

We should hasten to increase their number, but we must also recognise that the present Vickers tank is both an interim and an expensive weapon. My own view is that the course of progress will branch out from this starting-point in two directions—to a larger tank, strongly armoured and with a heavier armament, and to a much lighter machine-gun tank or car, which will gain security from its dispersion, its mobility, and the numbers which its cheapness will make possible. The first will be an artillery—or battleship—tank, and form the offensive base for the second—a cavalry, or destroyer, tank. The prototype of this second class may be the Martel-Morris tankette, or it may be a cross-country armoured car. Experiment has not yet reached the point at which we can begin equipping our forces with a standard machine, but it is urgent that we should press on the trials, for

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until then we must realise that the striking power of our Army is practically nil. And we must also realise that our object is not to produce a mere reconnaissance machine, but to replace the now paralysed infantry.

The French Infantry Manual of 1920 pointed the way, although the practical progress of the French Army since the death of General Buat has lagged behind. Red-hot from the forge of war experience, it laid down the cardinal truth that fighting strength could no longer be valued in "rifles," but by the number of automatic weapons. Each *groupe de combat* consists of one light automatic, and the men of the group only exist in relation to that weapon, according to whether their individual rôle is "to move it, serve it, feed it, or protect it." Under present conditions thirteen infantrymen are allotted to bring each light automatic into action, but the Commission which prepared the manual took a longer view and speculated whether "this law would lead in the future to further reducing the group, to constituting it of two or three men enclosed in an armoured and mobile shell." The law thus enunciated illumines our path in the future. For it is obviously cheaper and more effective if a light automatic can be brought into action by two or three men in "an armoured and mobile shell" than by thirteen unprotected men on foot. Both, dismounted, have equal defensive power, but the first has great and the second no offensive power. Taking the Martel-Morris as an example, the annual cost, including depre-

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ciation, of a machine with a crew of two would be no more than that of three existing infantrymen. But whereas an existing infantry battalion of a thousand men is incapable of attack against a machine-gun defence, a battalion of three hundred two-man tanks would swamp any defensive position in moving warfare—on which basis our Army is being trained. As well might a country maintain a navy consisting of many battle squadrons of wooden sailing-ships and one modern light cruiser to supply the punch. To-day we have a surplus of what is useless and a minimum of what is useful.

This condition also applies to our artillery ammunition. All authorities recognise that the present artillery strength of a division cannot produce a heavy enough bombardment to crush modern machine-gun defences. High explosive is of small effect except in lavish quantities, but smoke-shell, although it does not kill, produces a great " blanketing " effect in proportion to the number of rounds expended. The experience of recent training has brought out the lesson that artillery are better employed to support the tanks than to support the infantry, and that for this purpose smoke is the most effective—indeed, the essential means. Yet the proportion of smoke-shell to high explosive is in reverse ratio to this condition, and a major proportion of smoke-shell is an urgent need.

This lesson again has a direct bearing on the future trend of artillery development. When a tank attack is effectively screened by smoke,

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anti-tank guns become blinded victims, more helpless than the infantry they are supposed to protect. A tractor-drawn gun is little better situated than a horse-drawn, for neither can hope to move outside the smoked area and come into action again before the tanks are upon them. Here the self-propelled gun scores, for it has only to start up its engine and move forward. And as the S.P.G. is virtually an artillery tank, it "propagates the gospel" that the best anti-tank weapon is another tank. But although fuller production will bring the self-propelled gun far below its present price of £12,000, it is unlikely, both on financial and tactical grounds, that all the artillery will become self-propelled. In what form, then, will the bulk be mechanised? I do not think the "dragon" will be the standard means, because it is more powerful, and hence more expensive, than is required. Further, the delicate mechanism of the gun cannot stand the strain of being drawn at a high speed for long road distances, and this fact must be a hindrance to the adoption of the otherwise efficient and cheap half-track lorries, such as the Crossley, for artillery traction. Another alternative is to adopt the French method of carrying the gun in a lorry on the roads, and carrying also a small tractor, which is used to tow the gun from the road to the gun-position. This solution is a compound compromise, uneconomic of force and money, and a better solution would seem to be to carry the gun in a large six-wheeled lorry, which could move both on the roads and across country.

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Among the various arms, only cavalry remain for discussion. They at least have a greater value in proportion to their present numbers than have infantry. True, against an enemy well equipped with machine guns they have no offensive value mounted, and when dismounted become merely infantry weakened by the drain of horse-holders. But they are endowed with mobility, which the infantryman lacks, and until mechanical invention supplies a better substitute for the horse, cavalry will remain an asset for close reconnaissance. But for such limited use it would seem an expensive investment to maintain large cavalry formations at home—by one of the many paradoxes of our post-war Army we keep cavalry formations but not divisional cavalry, which are really needed. In India and a few other parts cavalry have undoubtedly still an offensive value against an ill-armed enemy, but it would seem a moot point whether a native cavalry force raised on the spot would not be more economic than to retain a large British establishment, with another at home, for a purpose which must become more circumscribed with every year that passes.

From composition and equipment we pass to training. For a mechanical army, with which moves of 100 miles a day are foreshadowed, the problem of training room is beset with difficulties. The areas at Aldershot sufficed for a foot-marching force, but even with the slight infusion of mechanised troops in recent years the artificial limitations have cramped almost every exercise.

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The problem falls for immediate investigation, and if Aldershot cannot be expanded it must ere long be abandoned, and in the meantime we must acquire ground in more remote districts before the widening ripples of the suburban tide engulf them also. A still worse handicap to realism, and to practical benefit, is the lack of any rational system of tank umpiring. First aid may be given by more systematic organisation of the umpiring, and a careful preliminary study of the opposing tank plans and anti-tank positions, but this will not be a remedy for the present false basis. A thorough series of tests is needed, with and without smoke, to be carried out on an artillery range, but with tank officers in control of the targets, choosing their route, and allowed to use an adequate number of targets. The crews of both guns and tanks should be selected at random, not formed of carefully picked experts. From the data thus gathered an average could be determined. This figure should then be divided, say, by 4, to represent the disturbing effect of battlefield conditions and enemy fire upon the gunners' aim. Even so it would be generous to them, for naval gunnery statistics suggest that division by 40 would be more true to reality.

My next point is that, with a mobile army, control must be more prompt and flexible than ever, whereas in many exercises recently the reverse has occurred. The exceptions pointed the way of progress. Headquarters must become mobile, commanders must keep almost on

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top of their forward troops, and they might supplement this revived personal direction by using selected officers—each with dispatch riders—for liaison forward, as Napoleon employed his expert aides-de-camp. It is a significant sidelight that, even under the present partially mobile conditions, liaison agents and dispatch riders have proved a quicker means of communication than cable. This ideal of greater mobility also applies to the tactical action of the infantry nucleus, who will still be needed to serve in the land-marines of the mechanical army. Even in wooded or hilly country machine guns will still be an obstacle, if a less effective one, and to overcome them the "men who fight on foot" must become light infantry of the Peninsular pattern, agile groups of skirmishers who will exploit to the full the tactics of infiltration and manœuvre. When infantry are reduced to a rational proportion this high standard will become practicable, particularly if we save more time for tactical training by bringing our drill up to date—basing it on modern tactical movements instead of on those of Waterloo, as in the present drill. What infantry lose in numbers they will gain in status; the hollow mockery of calling them the "decisive arm" is no compensation for being treated as mere barrage and tank followers, and to be the picked "light infantry" of the future mobile army is a greater distinction than being the "cannon-fodder" mass of the present.

Next, I would emphasise that one of the

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serious difficulties of mechanisation is the lack of, and lack of encouragement to, a mechanical outlook and training. No papers are set in promotion examinations, no credit given in reports; an aspiring subaltern may earn himself a good mark if he hunts, but one who spends his spare time in a workshop or under a car is more likely to be regarded as a crank. Soldiers are advancing towards mechanisation, but, like Lot's wife, some are looking back over their shoulders. The example set from above deeply influences the younger men who will be called on to handle the machines of the future, and so long as mechanical ignorance is a source of mistaken pride, so long must we lose much of the value of the new machines which the taxpayer provides.

Finally, let us turn from the military domain to the sphere of policy. Our expeditionary force of four divisions is essentially a striking force, only that in reality it has no striking force except against ill-armed or savage foes. Its purpose in case of another large-scale war is, as in the past, to strike a rapid blow in aid of our Allies while we are expanding the national forces at home. If our Allies of 1914 regarded the six divisions of the British Expeditionary Force as a mere drop in the bucket, what value can they attach to the four present divisions of infantry in these days when the machine gun dominates the battlefield? With them manpower is cheap, but mechanisation expensive. With our highly paid professional Army, the

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conditions are reversed. A wholly mechanised expeditionary force of the same cost would be not merely a valuable, but probably a decisive reinforcement in any struggle between the conscript armies of other Powers. And because of this, we should be an immense asset towards European peace, by discouraging the zest for war of any foreign Power.

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CHAPTER III

THE DOMINIONS AND MECHANISATION

It is an elementary axiom of education that instruction through the eye is a more potent medium than instruction through the ear, and equally is it true in psychology that a visual demonstration is worth more than any amount of argument—in common language, "seeing is believing." Herein lay the inestimable value of the tank demonstration which was given at Camberley during the Imperial Conference to the Dominion Premiers and other delegates. It may prove for military evolution a second, but peaceful, Battle of Cambrai, as epoch-making as that surprise assault in the dawn of November 20, 1917, which revealed the new key that a year later was to unlock the hitherto impenetrable trench barrier on the Western Front.

Those who, by logical reasoning, without visual proof, can foresee a coming change are always few, and thus it is not surprising that conversion to the idea of mechanised warfare had been limited mainly to members of the Home Army who had watched with close attention the rapid strides of tank experiment and cross-country movement during the post-war years. But the Camberley demonstration revealed the truth to a far wider and more influential circle—the political chiefs in whose hand

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rests the control of military policy, and by proxy, through them, to the citizens of the Empire, who, as they provide the money, are vitally concerned that the expenditure for which they are taxed should yield the highest degree of security.

The signal triumph of the tank and its offspring, and the vivid contrast, so effectively portrayed, with the low efficiency and cumbrous size of the old muscle-moved units which were shown to point the moral, seem to have convinced even the "doubting Thomases" among the spectators. Here was planted the seed; what will be its fruit?

So far as the forces under the War Office are concerned, the authorities committed themselves by this demonstration perhaps more fully than they realised. They must accelerate the process of mechanisation, for if they delay the public will say: "You have shown us conclusive proof of the superiority of the mechanised soldier; you have even rubbed in the weakness of the old who had to depend on his legs for movement, his skin for protection, and whose feeble muscles could carry no weapon more powerful than a rifle; why on earth are you keeping, and making us pay for, an Army most of which on your own demonstration is obsolete—one hundred and thirty-six battalions of infantry and twenty-six horsed brigades of artillery? We decline to continue pouring out our money in order that the lives of our sons shall once more be sacrificed on machine-gun-swept battlefields."

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So certain is such a retort if progress lags that we can surely take the Camberley demonstration, not merely as a healthy sign of the progressive spirit which inspires the present General Staff, but as virtually a pledge that mechanisation will be hastened as far as it lies within their power. The Imperial effect of this object-lesson is, however, almost as important. The question has two facets—India and the self-governing Dominions. The influence of India on our own problem is more direct, for so long as the Cardwell system is not refashioned to modern conditions the Home Army acts primarily as a draft-finding reservoir for the garrison of India, and so long as the authorities there remain unresponsive to progress they automatically serve as a brake on the remaking of the Home Army. While India clings to the notion that a quantity of scattered packets of infantry control its vast areas better than a mobile garrison of cross-country armoured cars concentrated at pivotal points, so long must the War Office perforce maintain proportionate infantry battalions at home. And so long will sorely tried infantrymen be exposed to the brickbats of riotous mobs, with the shadow of an Amritsar hovering near, where a timely whiff of tear-gas—as used by the American police—from a car impervious to brickbats would convert the rioters from candidates for martyrdom into unharmed objects of ridicule.

The one catchword invariably used to justify this stubborn attitude is "the North-west Frontier." But this region is only a small part

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of India's vast area, and only a part also of her problem. And even in regard to invasion is it by any means likely that in these days of mechanisation an enemy would entangle his main forces in the Hindu Kush and the Khyber route, when by a more southerly sweep he could find an easier gateway through Baluchistan? If the "Dunster-force" could traverse the Persian Plateau to the Caspian in ordinary Ford cars, a modern mechanised force might well pass over the Herat and Kandahar route. Again, where Citroën-Kegresse cars have conquered the Sahara, and ordinary cars the Gobi Desert, modern cross-country machines should be able to cross the arid regions of Southern Persia, where the natural obstacles are far less than by Kandahar.

To maintain the whole Army in India, and in consequence that at home, on a mediæval basis solely because of a mountainous sector which any serious invader would avoid is surely an anachronism. Those who still take up the hoary argument that "tanks and tractors are well enough for a European war, but our Army may have to fight in Central Asia," might well reflect upon the feat of the Andrews expedition in 1926, which used seven motor-cars in exploring Western Mongolia, and "travelled 10,000 miles in a region where there were no roads, and at the end the cars were sold, as they stood, with no repairs, for more than they cost in America when new."

The problem of the self-governing Dominions is different and less acute, but important to us

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at home, and still more to themselves. Its influence on the mother-country, if indirect, is that the greater their military weakness in self-defence the heavier is the burden thrown upon our own already strained resources. Further, for effective co-operation in another Imperial emergency, it is highly desirable that the military forces of the Dominions should keep pace with our own in equipment and organisation. While we cherish the memory of the way in which the Dominions dispatched contingents to our support in 1914, we have to recognise that their military forces in peace are organised for self-defence, and not as expeditionary forces. Any suggestions on their evolution must, therefore, take this fact as the starting-point. Secondly, the peace-time forces consist of a small permanent nucleus which provides the instructional cadre for the main armed body—a citizen militia.

The military problem of Australia and New Zealand is that of resistance to overseas invasion. It is similar in the case of Canada, except that invasion might come overland, and that its gravity is diminished, first, because of the unlikelihood of a war with the United States, and, secondly, because of the trust which Canada undoubtedly places in the protection given by the Monroe doctrine. The military problem of South Africa is different, internal more than external. Although a vital pivot of the Empire's sea communications, she is too distant from the bases of any possibly hostile naval power to be in danger of overseas invasion. By land routes

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also she is too remote from the territory of any civilised Power. Her possible danger springs from the preponderance of her coloured population and from the native races beyond her borders.

Leaving South Africa aside for the moment, we may turn to consider the treatment suitable to the broadly similar problems of the first three self-governing Dominions. The purpose for which their forces are raised, their composition, and their problem combine to indicate that defensive, not offensive, operations are their natural rôle. Their object is to resist invasion and gain time for the expansion of the national forces in rear, as well as for the arrival of help from the other partners in the Empire. What extent of frontier have they to cover?—Australia, 12,000 miles; New Zealand, 4,000 miles; Canada, a land frontier of 3,000 miles and a practicable sea frontier of about 1,000 miles. What pattern of force have they got for this purpose, and in what measure does it fit this rôle of a delaying resistance? The forces of all the Dominions are at present of orthodox pattern, the main part infantry, with a proportion of cavalry and of horse-drawn field artillery. Is it possible that such an infantry-based militia, slow to mobilise and inevitably slow in movement, could possibly protect such immense frontiers or be concentrated in time at the threatened spots? If not, and such must assuredly be the answer, is there any remedy without increasing the military outlay?

The Dominions have only to recall the experi-

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ences of 1914–1918 in order to appreciate that the machine gun, and not the infantryman's rifle, is the real weapon of defence in modern war. One machine gun, well sited, could and did hold up a battalion, even a brigade, of infantry. To break through a defensive chain of machine guns without tanks or without the overwhelming artillery strength of trench-warfare days would be impossible. And no invading expedition could transport such masses of guns nor the ammunition required. Hitherto, the machine gun has been as immobile as the infantryman, but now the invention of the six-wheeled cross-country vehicle, ideal for the vast roadless stretches of the Dominions, has endowed this weapon with a fluidity which multiplies many times its unrivalled defensive power.

Sixty-two battalions of infantry—Australia's present Citizen Force establishment—are utterly inadequate to defend the Australian continent, but sixty-two battalions of mobile machine guns in cross-country carriers would be capable of such rapid concentration and movement that no invading army of infantry and cavalry could hope to make effective headway against its elastic resistance. Only an army of tanks could break it, and such an army is not yet on the horizon of any foreign Power. Best of all, the change would involve no increased cost, for the six-wheeled lorry is a cheap commercial product, the running cost per ton-mile lower than that of the present four-wheeler, and thus, except for a training nucleus, the bulk of the vehicles could

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be drawn, in emergency, from civil use once this has been fostered in the Dominions.

As offensive action is a secondary requirement in the present forces maintained by the Dominions, the question of creating a tank arm might well be postponed until the War Office has carried its experiments and tests a stage further and itself reached a decision as to the future types with which to equip the Home Army. In this way the Dominions could benefit from our research at no expense to themselves. But in order to add to their mobile machine-gun units the power of counter-attack, a proportion of their cavalry might be converted, with advantage, into cross-country armoured-car units, by fitting armoured bodies on the chassis of the larger-pattern six-wheeled vehicles.

If this be the suitable direction of military development to meet the problem of Canada, Australia, and New Zealand, the fact is at once clear that, although the problem of South Africa is different, its military treatment is similar, for the mobile armoured car and machine-gun carrier has proved in Egypt and Palestine the cheapest and most effective means of dealing with native risings and irruptions, and the terrain of South Africa might have been devised by Nature for the advantage of the cross-country vehicle.

While the decision as to mechanisation rests entirely with the different Dominions, to whom these suggestions are submitted in all respect, there is still a further aspect of the question which deserves attention—that of mutual bene-

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fit, civil as well as military. The New Zealand Prime Minister, in his statement after the Camberley demonstration, went to the core of the question when he said: "The demonstration clearly indicated to me the value of new mechanical means of transport for uses other than war purposes. . . . In pursuing investigation and experiments in its own sphere the Army is providing most valuable data and ideas for the commercial development and utilisation of motor traction in directions hitherto not exploited. . . . The work is of immense value not only to Britain, but to the whole Empire—and not only from the point of view of war purposes, but from the commercial outlook." Britain, in fact, can give the Dominions the free benefit of her mechanical experiments as a means both to security and to the civil exploitation of their vast undeveloped areas, while they, in turn, by fostering the use of these new machines can not only help our motor industry, but facilitate the mechanisation of the Army, a process more secure and less expensive once a commercial demand for combined road and cross-country vehicles is assured. Here, indeed, is one line of true Imperial co-operation for the common advantage.

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CHAPTER IV

THE REBIRTH OF CAVALRY

AUGUST 9, A.D. 378

A SULTRY summer day on the plains of Adrianople; two armies engaged in desperate struggle—one the shield and symbol of Roman imperial power, the other the embodiment of the Barbarian challenge to Rome's sovereignty.

The Emperor Valens—confident in the superiority of the Roman legion, through long centuries the "queen of battle" and with all the traditions of a thousand victorious fields behind it—had marched out from the shelter of Adrianople's walls that morning to attack the Army of the Goths under their famous leader Fritigern. The moment was inopportune to the Goths, for the main body of their cavalry was away foraging at a distance. With a craft worthy of the Byzantine Emperors later, or of Kutusoff before Austerlitz, Fritigern employed an embassy to gain time for the recall of his cavalry. The parley proving fruitless, the Roman Army developed a strong attack on the Goths' position. The scales of victory hung in the balance, when suddenly a cloud of dust appeared in the distance, growing rapidly larger and nearer until it materialised as the mass of the Gothic cavalry. Riding straight to the battlefield, the flying squadrons

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of Alatheus and Safrax charged like a thunderbolt against the flank of the Imperial Army.

"Two of Valens's squadrons, which covered the flank of his array, threw themselves in the way of the oncoming mass, and were ridden down and trampled under foot. The Goths swept down on the infantry of the left wing, rolled it up, and drove it in upon the centre. So tremendous was the impact that the legions and cohorts were pushed together in helpless confusion . . . in a press that grew closer every moment. The Roman cavalry saw that the day was lost and rode off without another effort; then the abandoned infantry realised the horror of their position; equally unable to deploy or to fly, they had to stand to be cut down. . . . Into this quivering mass the Goths rode, plying sword and lance against the helpless enemy. It was not until two-thirds of the Roman Army had fallen that the thinning of the ranks enabled a few thousand men to break out." [1]

When the sun went down that evening on the corpse-piled battlefield of Adrianople, it set also on the great Roman Empire, for, though the twilight was to be prolonged for several centuries, the spell that Rome had cast upon the Western world was shattered. The end was postponed by taking the Barbarians into partnership; henceforth the Emperor might be senior partner or sleeping partner in the firm, according to his ability and circumstances, but he was never again to exercise the sway of

[1] Oman, "Art of War in the Middle Ages."

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earlier days. As a military disaster to the Roman arms Adrianople finds its one counterpart in Cannæ, but its political significance is far greater.

It is, too, as great a landmark in military as in world history. For nearly six centuries, since Zama and Cynoscephalæ, the Roman infantry had been the dominant factor in warfare, its legions the instrument and token of world-power.

On the ninth of August, A.D. 378, the sun set on the supremacy of infantry, the glory of the legions was buried under the heaps of the slain, and the age of cavalry was ushered in. It was to last for nearly a thousand years—until the Swiss pikemen at Laupen and the English bowmen at Crécy reversed the balance.

AUGUST 8, A.D. 1918

Another summer day, on the banks of the Somme in front of Amiens; again the fearful clash of two armies—one the weapon of Imperial Germany in her bid for world supremacy, the other the shield and symbol of outraged civilisation in defence of her liberty. In her Army Germany possesses a superbly trained instrument that reminds us of the Roman legions. For half a century her arms have been the menace of the modern world and, in tactical efficiency at least, have maintained the traditions of 1866 and 1870. During four years her machine gunners, heirs of the Roman legionaries, have

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defied all the efforts of orthodox tactics to overthrow them, exacting as the price of any gain a cost in Allied lives out of all proportion to the barren results.

The foresight and insight of a small group of men, helped by the practical mechanical aptitude of a few more, had provided us with a new weapon—the tank, originally intended purely as an antidote to the German machine guns and trenches. The obstacles and delays these pioneers met with are now part of history. Even when the tank emerged into being, for more than a year its advantages were lost, used in driblets or frittered away in the bogs of Flanders —ground essentially unsuitable to its limitations —until at Cambrai, in November 1917, its correct tactical employment was at last appreciated by authority, as distinct from its originators.

The story of 1918 is too recent history to need much repetition. The Allied Armies, reeling under a series of onslaughts, were still "with their backs to the wall" when the counter-stroke of July 18 came to their relief. Even so, it seemed to an anxious waiting world that the scales still hung trembling in the balance. Hope was revived, but, even if the best befell, all felt that the path to victory must be long and arduous; none assuredly was vouchsafed a vision of what was to come about in three brief months.

The curtain fell and remained down for some weeks, while the world waited expectant for the next act of the drama; only a privileged few

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were allowed behind the scenes. Then, in the early hours of August 8, the blow fell—the German machine gunners were overrun and slaughtered by the charge of British tanks almost as helplessly as their forerunners at Adrianople, exactly fifteen hundred and forty years before. Let the story be epitomised in the words of the enemy, of Ludendorff himself: "August 8 was the black day of the German Army in the history of the war. . . . The divisions in line allowed themselves to be completely overwhelmed. Divisional staffs were surprised in their headquarters by enemy tanks."

The victorious method of August 8 was repeated and repeated, in essentials at least, during a brief and glorious "hundred days," until the German power and will to resist were broken. On this last phase the verdict of Ludendorff is: "Mass attacks by tanks and artificial fog remained hereafter our most dangerous enemies."

. . . . .

In this historical parallel between the ninth of August, A.D. 378, and the eighth of August, A.D. 1918, lies, it is claimed, a clue to the stalemate of the Western Front in the World War, to the four years' stagnation of trench warfare which was both the outstanding feature and the dominating factor of the world-conflict on land. The rival Armies were as powerless to shake free from the toils of the trenches as were often the actual men from the clinging mud of those same trenches. During those four years, offensive after offensive was staged and

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launched on either side, desperate and costly assaults hurled against the trench barriers—to gain a few square miles, or less, of desolated, useless ground at the price of scores of thousands of lives, the losses of the self-acclaimed victors far exceeding those of the side which yielded these barren acres.

A school of thought has arisen in Europe since the war—Jean de Pierrefeu is the best-known example—which draws from these futile assaults of 1914–18 the lesson that "the offensive" is inherently faulty as a form of action. The eagerness of many of them, especially in France, to find any stick with which to beat the pre-war dog—the rival school which formed the entourage of Joffre and dictated the extreme offensive strategy of 1914—makes them overlook the *reductio ad absurdum* to which a general acceptance of the offensive-defensive doctrine leads us.

It was not the principle of the offensive which was at fault, but the methods by which the general staffs tried to carry it into effect. Worst of all was their failure to grasp that the development of modern weapons had made war lopsided, and that until this lopsidedness was remedied not only were all offensives doomed to sputter out in a welter of useless bloodshed, but no decision could be possible save by the slow and mutually suicidal method of attrition.

The Russo-Japanese War gave us a foretaste of the stagnation of 1914–18, but the lesson was lost on the general staffs of the world, who continued to develop the effect and range of

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weapons without troubling about their mobility, lacking which the offensive power of weapons merely stultifies itself. Thus does the technical study of a profession tend to blind men to its broader aspects, losing sight of the wood for the trees. Yet to any intelligent man, soldier or civilian, with a bare knowledge of the history of warfare, the lopsided nature of twentieth-century armies, its cause, and its inevitable consequence, should surely have been apparent.

The conduct of war, as distinct from its technical details, is a matter of pure common sense, and throughout military history the hall-mark of the Great Captains has been that they stripped the art of war of the entwining coils of professional custom and prejudice that habitually spring up in each era like ivy until they suffocate and drain the sap from the tree of common-sense action. All fighting, whether a street scrap between two corner boys or *la grande guerre*, is in essentials the same, and to clear our vision of the undergrowth of custom and technicality we do well at intervals to go back and study war in its simplest form. In a bout of fisticuffs a man leads off with one fist in order to fix his opponent's attention and engage his resources, and then delivers the knock-out blow with his other fist.

The essence of these tactics is that the enemy is attacked from two directions practically at the same moment, so that in parrying the one he exposes himself to the other. Here in a nutshell is the ruling formula of all tactics, great or small—

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that of fixing combined with decisive manœuvre. That is, while one limb of the force fixes the enemy, pinning him to the ground and absorbing his attention and reserves, the other limb strikes at a vulnerable and exposed point—usually the flank or line of retreat and communications in war, just as it is the chin or solar plexus in boxing. If we read military history, we find that this convergent attack from two directions simultaneously was the master-key used by all the great artists of war, as distinguished from the mere artisan generals who relied on "push of pike" and sheer weight of assault.

Right through the ages, however, so long as armies moved and fought as a whole, uniting before action and drawing up in a definite order of battle, this convergent attack was purely a battlefield manœuvre obtained by overlapping one or more of the enemy's flanks, or occasionally by placing a fraction of the force in readiness just beyond the flank of the army. Save for exceptional instances, the product of circumstances rather than deliberate design, the strategic convergence was unknown before Napoleon and is the latter's supreme contribution to the art of war. The far-flung strategic movements of Jenghiz Khan and Subutai in the thirteenth century were undiscovered by students of war until recent years, and so have no place in the evolution of warfare among the European nations. In the strategic convergence two or more forces, or fractions of the army,

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converge on the enemy from distant points, the movements perhaps beginning long before, when the location of the eventful battlefield is no more than a shadowy idea in the mind of the commander-in-chief. In this connection the Battle of Adrianople has a special interest, for we may see in embryo a limited strategic convergence. Although the division of the Gothic Army, and the fact that the cavalry of Alatheus and Safrax were at a distance, were due to the exigencies of forage and not to design, it is curious that the dramatic success of this convergence from outside the battlefield arena evoked no echo in the military thought of the time or of subsequent centuries.

But the tactical use of the convergent attack may be traced in nearly every famous victory throughout history, and we find almost invariably that the infantry is the arm used for fixing the enemy and the cavalry for the decisive manœuvre—because of its natural suitability for rapid out-flanking movements, the devastating momentum developed during its charge, and the demoralising influence its furious onset inspires in exhausted or shaken troops.

To Alexander belongs the credit of developing this wise application of the law of economy of force, and from Alexander at Granicus to Hannibal at Cannæ and Scipio at Zama we see the employment of cavalry for the decisive blow. Then for some centuries came the reign of the legions, with cavalry filling a comparatively minor rôle. By the highly developed skill of the

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legions the flanking action of cavalry was frustrated, as may be observed in Cæsar's tactics at Pharsalus. The reign of infantry continued, save for intermittent checks, until Adrianople, which, as we have noted, forced its abdication in favour of cavalry. Then for a thousand years cavalry was supreme and infantry became a mere accessory, to garrison towns or to operate in broken and hilly country. The decay of infantry was so marked that cavalry could ride it down by a direct charge and there was no need for tactical skill, nor in truth did it exist. This epoch was the Dark Ages of the art of war as well as of European civilisation.

With the growth of feudal chivalry, the mail-clad knight or man-at-arms was omnipotent against the raw, poorly-armed levies, raised in emergency, who constituted the only infantry. Guarded by his armour, endowed with mobility through his horse, and producing tremendous hitting-power for shock action in his spear and sword, thus combining in himself all three elements, he was able to ride down the infantry levies with impunity. For the time he was indeed an ideal fighting instrument, lacking only tactical skill. It was this deficiency which brought about his downfall almost as much as any counter-measures. He had not the knowledge and insight to warn him against the increasing tendency to sacrifice mobility for protection—by a constant augmentation of his armour, nor to apprise himself of his own limitations and dissuade him from frontal

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attacks over unsuitable ground against strongly posted infantry.

The discovery of these limitations in the fourteenth century, against the Swiss pikemen and against the English archers at Crécy, came as such a shock that he swung to the opposite extreme and discarded the mobility which was his supreme asset. Thus was seen the absurdity of Poictiers, with its dismounted cavalry masses hardly able to advance because of the weight of their armour, a dense and immobile target for the English bowmen.

With the introduction of firearms came a still further negation of the true cavalry doctrine, the squadrons riding up to the enemy's line, discharging their pistols, and then wheeling. The cavalry tactics of the sixteenth century were for the mounted arm to rely on its rudimentary firearms, as if in feeble imitation of the Mongol horse-archers of Subutai, instead of on the shock of the charge.

To Gustavus Adolphus is due the credit of introducing into modern war the true tactics of cavalry and of combining the action of the two arms as had Alexander, Hannibal, and Scipio. Thus it is that we see, again, infantry fixing the enemy and cavalry for the decisive manœuvre, in such famous examples as Cromwell at Naseby, Condé at Rocroi, Frederick—or rather, perhaps, Seydlitz—at Zorndorf, Napoleon at Dresden, Wellington at Salamanca.

The renaissance of cavalry in modern history was a revival of the characteristics of the era

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of Alexander and Hannibal, rather than of the cycle opening with Adrianople, for infantry, being now equipped with firearms and supported by artillery, was able to hold its own. It was perhaps fortunate for it that while these new weapons were in their infancy cavalry tactics were lacking in vigour and speed, and the progressive revival of cavalry shock-action coincided with a steady improvement in firearms, so that infantry was generally able to resist the onslaught, except when shaken or caught in disorder.

Unhappily for cavalry, also, its possibilities of tactical progress were necessarily more limited than the mechanical possibilities of firearms, and in actual fact reached their zenith while the flintlock musket was still the staple infantry weapon. Then in the middle of the last century came the invention and general adoption of the breech-loading rifle and the Minié elongated bullet, and the increased accuracy and deadliness of infantry weapons soon brought about the virtual extinction of the cavalry charge.

But a traditional reluctance to face new facts delayed the general recognition of this truth. In 1870 the success of the Uhlans as a protective screen and for reconnaissance obscured both the rarity of offensive cavalry-action and the disastrous results of the few charges that were made, such as at Worth and Vionville. Clear thinking would have distinguished between the separate rôles of guarding and hitting—the latter of which was no longer feasible

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Finally, with the twentieth century came the machine gun and the automatic rifle, and with them the definite and complete disappearance from the battlefield of the cavalry charge.

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The action of cavalry was vital to the functioning of the body military, and when it ceased to work, warfare became stagnant.

To grasp the reason of this we have but to dissect war in terms of its three basic elements —guarding, moving, and hitting. The keynote of cavalry and its essential value have always lain in its mobility. In the first place this mobility has made it the best instrument to reconnoitre and to gain information about the enemy and his movements, and to form a protective screen at a distance from the main forces. This form may be termed guarding-mobility. Modern invention has, however, given us in the aeroplane an instrument immensely faster, possessing a far greater range both of movement and of observation, and untrammelled by surface obstacles, because flying above them—but, by reason of this, unable to carry out such a thorough and detailed reconnaissance as can a cavalryman who moves along the ground.

By the universal consent of all general staffs, aircraft have replaced cavalry as the means of distant reconnaissance, leaving to cavalry the duty of close reconnaissance and acting as a protective screen within a short radius of the main forces, supplemented, however, by armoured cars on the roads. It is possible that even this rôle may

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be taken over by light tanks, cross-country cars carrying lightly equipped infantry, or scouts mounted on tractorised motor-cycles. The change may be hastened by the rapid disappearance of the horse from civil transportation.

In the second place comes the mobility of cavalry for strategic movements, a means by which a commander could transfer part of his strength from one point to another to effect an unexpected concentration of force at some vital spot. Even in the past the value of cavalry was hardly distinguishable from that of mounted infantry in this respect, and now the development of railway and motor transport for troop movements has practically replaced them for this function, save in desert or undeveloped lands. Even in the latter the cross-country car threatens their position, if we may judge by the French exploits in Morocco and the Sahara.

Finally, there is hitting-mobility—that used for direct offensive action—which lies in the impetus of attack and demoralising effect given by speed of onslaught. This has been the rôle of heavy cavalry, as distinct from the early dragoons and their successors, mounted infantry. In the cavalry charge has rested the supreme value of this arm. From Adrianople to La Haye Sainte a thousand fields have borne witness to its sovereign efficacy.

But when modern fire made this impossible on the battlefield—though the farce was still played at the German manœuvres to please the showman's eye of the Kaiser—the punch went out

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of warfare, defence triumphed over attack, and the conception of decisive military victory became a mirage in the desert of trench warfare. Infantry aided by artillery could fix the enemy, disrupt and disorganise his screening forces, but there was no effective means of completing their efforts by a decisive blow such as cavalry had formerly delivered. Here lay the root-cause of the stalemates of the Russo-Japanese War and the World War, the reason why during the years 1914–18 it proved so easy to break into the enemy's trench positions, so difficult, nay impossible, to break through them in time to smash his resistance and prevent him preparing fresh positions a mile or two in rear.

It became one of the tragic jokes of those weary years to see the cavalry massed, in readiness for its long-awaited rôle, behind the point where a grand attack was to be launched, raising hopes never to be fulfilled, for, if even isolated squadrons attempted to pass through, a few odd machine guns sufficed to bring to a halt their vain advance.

Can a more severe comment be made upon the leaders of the armies than they themselves afforded by their Micawber-like faith that " something would turn up " to give cavalry its chance —presumably to enter a Promised Land where inconvenient machine guns did not exist—and by their lack of effort to provide a substitute for cavalry's rôle suitable to modern conditions ?

The deadlock was broken only by the coming of the tank, a new weapon thrust upon the

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military hierarchy in face of their distrust and opposition. Misused at first, whether from obtuseness or of intent, its value was disparaged by those who misapplied it, and its very continuance was in jeopardy until the astounding surprise coup at Cambrai in November 1917.

The decisive part it played in the drama of 1918 was acknowledged, somewhat grudgingly, by the Allied commanders and, more emphatically, by the Germans who suffered from it. But with the coming of peace a characteristic reaction took place toward time-honoured and traditional methods—typified by the officer who at 11 a.m. on November 11, 1918, heaved a sigh of relief on hearing the Armistice signals, exclaiming, "Thank heavens! Now we shall be able to get back to *real* soldiering!"

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It is an axiom that nations learn more readily from defeat than from victory, and though for the nonce Germany is prohibited from building tanks, her post-war military reviews and textbooks bear ample witness to the study that is being devoted to them and their tactics. Will she repeat both the recovery of the Eastern Roman Empire and the basic idea of its military reorganisation? "Theodosius, on whom devolved the task of reorganising the troops of the Empire, appears to have appreciated to its fullest extent the military meaning of the fight at Adrianople. Abandoning the old Roman theory of war, he decided that the cavalry must in future compose the most important part of the imperial army."

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Unable to provide this new arm in sufficient numbers or quality from home resources, he obtained it by enlisting wholesale the services of Teutonic allies. Here again we may ask ourselves whether Germany, temporarily debarred from producing her own tanks, though for different reasons, will use Russia as her tool in developing these new sources of military power.

Whether the former Allied Powers have imbibed the lessons of 1918, and adequately developed the means that brought them victory, is a moot point.

Financial stringency and war-weariness played certainly as great a part as conservatism among military authorities in preventing far-reaching schemes of tank-expansion. There is justice in the claim that, as tank design is still in its infancy, such money as is available can be more wisely spent in experiments to develop more efficient and reliable types of tank than in equipping armies with a large number of tanks that may be obsolete in a few years.

Meanwhile, however, post-war reorganisation and establishments have been crystallising, and when once the proportionate strengths of the various arms are settled they have a tendency to become fixed. Save under the stress of shocks of war, large changes are difficult, if not impossible, to bring about. In peace-time, with estimates and expenditure rigidly limited, an increase in one arm implies the reduction of another, and, as is but natural, sentiment and interest combine to resist the change. Disbanded regiments mean

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not only marred careers but the severance of great traditions. To transplant individuals from one regiment or corps to another is too often productive of discord and discontent under the settled conditions of peace-time. Thus it is rarely feasible, save under the pressure of an imminent and vivid emergency such as will spur men to sacrifice their personal feelings and interests for the sake of the army and the nation. It is this fact that causes disquietude over the otherwise sound policy of experiment before production. Inevitably, military organisation and thought are settling down into definite channels all the time the experiment is going on.

In the 1919 campaign 10,000 tanks and 7,500 cross-country tractors were being built for the Allies. Now the British Army has only four tank battalions.

The French Army has a far greater number of tanks, though its tanks are obsolete and its mechanical progress lags behind its ideas. But it at least works on the basis of a higher proportion of tanks to the other arms than does this country, where one tank battalion to a division is the proportion that is visualised.

To appreciate that this idea is retrogressive, there is no need to project ourselves into the far future, with its visions of naval warfare on land waged by tank fleets. Plain common sense and a knowledge of history will show us that, even if warfare moves in cycles, they are progressive cycles, and that each succeeding war in modern times between the Great Powers

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shows an advance mechanically on the last, and at least begins where the last left off.

What, then, is the cause of this step back in the proportion of tanks to the other arms?

There is no question that the general staffs of all nations regard the tanks as a valuable adjunct to the arms already existing—infantry, cavalry, artillery.

Yet curiously, in this very recognition, as we have stated it, lies the explanation of the small proportion of tanks to the other arms in the armies of 1925. Similarly, with subordinate commanders, the value many of them now place on tanks is the cause of their misuse in post-war manœuvres.

Despite the high speed and relatively less obstacle-crossing power of the latest tanks, they are still regarded as an adjunct to the infantry, and a means of helping the latter—as was the primary purpose of the tanks in the World War.

The root of the difficulty lies in the fact that for centuries soldiers have been accustomed to think in terms of three main arms—infantry, cavalry, artillery. Then in the last war came the addition of tanks, and soldiers were in a quandary where to place them. The British treat them as an extra arm to the three originals; the French consider them as part of the infantry.

The right classification and right use of tanks are to be found by a study of history in the light of the unchanging and fundamental principles of war—with one eye on the past and the other on the future, for history has a strange way of repeating itself.

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Herein lie the explanation and the object of our opening comparison between the ninth of August, A.D. 878, and the eighth of August, A.D. 1918. The deduction is that tanks are not an extra arm, or a substitute for infantry, but the modernised form of heavy cavalry.

Cavalry enthusiasts, reluctant to see their old love disappear, draw such grains of comfort as they can from its success in the limited spheres of close reconnaissance and for movement in uncivilised lands which happen to be flat and suitable for cavalry. In their anxiety to prepare a case for the defence they overstress this limited value. If, instead of thinking of cavalry as men on horseback, they thought of it as the mobile arm, the source of many misconceptions and prejudices would be removed. For in fulfilling its historical functions cavalry has assumed many different forms and comprised radically different types and patterns.

On the other hand, the modernist school that considers cavalry an anachronism is apt to concentrate its energies on destructive criticism. What neither side seems concerned with is to remedy the lopsidedness of modern warfare and to discover a substitute for the vitally important rôle of decisive manœuvre formerly fulfilled by cavalry—a rôle that was indeed the main purpose of the mobile arm.

It is not too much to say that the drying-up of cavalry action has caused the decay of general-

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ship and that the art of war as understood by the Great Captains cannot revive until a substitute for cavalry's former offensive rôle is recognised—for it has already been found, if the history of war be appraised logically. The Battle of Amiens needs to be studied in the light of the Battle of Adrianople.

The tank is at least as well protected against infantry weapons as was the mediæval cavalry, its range and speed of movement are greater, its hitting power superior—making all allowance for the vastly improved weapons it has to face.

Like the cavalry of old, the tank has its limitations; there are certain types of ground on which it is handicapped and certain defences against which it is helpless. These limitations must be appreciated, and its tactical employment based on them, as were those of cavalry by the Great Captains. Has the eighth of August, 1918, ushered in a tank age, as the ninth of August, 378, brought in a cavalry age? Only the future can tell. The status of infantry is now in the scales. Those who shared in the experience of 1918, and even more those who have watched the latest tanks sweeping over rough country at fifteen to twenty miles per hour, swinging round in their own length and then off again, like prehistoric monsters of Conan Doyle's "Lost World," can have little doubt that, on ground suitable to tank action, infantry is helpless against them. But in most countries there is wooded, hilly, or swampy ground where tanks cannot operate. By taking advantage

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of such tank-proof localities and area, infantry may retain a useful rôle until a modern successor of the longbow of Crécy is invented to restore the balance.

Conversely, the full benefit of the tank substitute for cavalry depends on how far the commanders of to-day take to heart the lesson that mediæval chivalry failed to appreciate until taught by bitter experience, and then misinterpreted in such a way as to rob cavalry of its chief asset, mobility. So long as tanks are intermingled with infantry and frittered away in driblets on unsuitable ground, they will be no more effective than the fourteenth–sixteenth century cavalry, before Gustavus Adolphus.

Once appreciate that they are not an extra arm or a mere aid to infantry, but are the modern form of heavy cavalry, and their correct tactical use is clear—to be concentrated and used in as large masses as possible for decisive manœuvre against the flanks and communications of the enemy, which have been fixed by the infantry—themselves mechanised—and artillery.

Then not only may we see the rescue of mobility from the toils of trench warfare, but with it the revival of generalship and of the art of war, in contrast to its mere mechanics. Instead of machines threatening to become the masters of man, as they actually did in 1914–18, they will give man back opportunities for the use of his art. On the battlefields of the future may be repeated the triumphs of an Arbela, a Cannæ, a Zama, or an Austerlitz. It will then again be

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true to say with Napoleon: "it is the *man*, not *men*, who counts in war." The realisation that the proper rôle of the tank, at present a Cinderella, is the supremely vital act of decisive manœuvre will do more than anything else to sweep away the prejudice that always attaches to an innovation, and so pave the way for a readjustment of the proportions of the various arms.

Better still, the restoration of a mobile arm for offensive action will keep alight the cavalry spirit, the very soul of war. To-day the germs of trench warfare still linger in the military system, with all their deadening effects on mind and action, which can be counteracted only by inoculation with the serum of mobility. To save us from the indecisiveness of recent methods of warfare, which inflict permanent injury on the economic life of both sides, we stand in great need of the lightning grasp of a situation, the rapidity of action, and the energy in exploiting the fleeting opportunities of battle, which are the essence of the cavalry spirit.

The tank assault of to-morrow is but the long-awaited rebirth of the cavalry charge, with the merely material change that moving fire is added to shock and that the cavalry tank replaces the cavalry horse.

Thus, to paraphrase, "The cavalry is dead! Long live the cavalry!"

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CHAPTER V

THE MOUNTED INFANTRY OF THE FUTURE?

In August 1925 on a deserted country by-road, shrouded from prying eyes by the deep Camberley pinewoods, I came upon an astonishing sight—a vision that swept me as on a magic carpet back to the Middle Ages, when armour-clad knights and men-at-arms rode, on errands of chivalry or brigandage, over the countryside. While I watched, before my eyes swept a menacing, armour-clad form, similar in size and build if not in motive power to the mediæval knight on horseback. But instead of a horse's unprotected legs this mount had steel tracks, and in place of a couched spear that infinitely more deadly weapon—a machine gun. Tearing down the road as fast as the knight could have galloped, this 1925 man-at-arms, mounted *in* his mechanical charger, drew rein, turned his steed's head to an almost perpendicular bank, fully four feet high, and mounted it with a sure bound. Then, racing over the rough ground, smothered knee-deep in gorse that concealed many a hole and ditch, he showed off his mount's paces, moving faster than any runner could have done, and faster than any horseman would have dared to attempt without risk of a broken neck. Next he turned towards a steep sloping hill and climbed it unhesitatingly at a speed that never fell below

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six or seven miles per hour. Finally, after threading his way through a tree plantation, so thick as to be barely traversable by horse or pack-mule, he swept round and round in narrow circles, no more than sixteen feet in diameter. This last performance would have turned his mediæval forerunner, a circus rider, or a taxi driver green with envy.

To anyone with experience of war, no imagination was needed to realise the effect of this unnerving apparition on a battlefield—it inspired acute sympathy with the feelings of the foot-soldier in old days, before the machine gun came to his aid, when caught in the open by charging cavalry! Though here the modern knight's intentions were friendly, not hostile, his circling rush was so swift and agile as to inspire qualms in a close-quarter spectator on foot—how much more in an enemy soldier on foot, that type of soldier who in the manuals of traditional armies is still styled the decisive factor in battle!

If the infantry soldier feels helpless when faced with the ordinary tanks of the day, he can buoy up his courage—with the moral assistance of superiors who will not have to meet these machines in battle—by the thought of certain compensations. The present tanks are costly to produce, as much as £9,000 apiece, and so there are comparatively few in the financially limited armies of the day. They are large, and so he can cherish the hope that his artillery may knock them out before they can reach him.

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Their very size makes their attentions impersonal, and so he prays that, being small himself, he at least as an individual may avoid their notice or, if not, perhaps dodge them.

But this mechanical mounted knight, this one-man tank, was itself so small that one could hardly discern it in the gorse until it was within a few hundred yards—coming on so fast that it covered the intervening distance in less than a minute. What chance would artillery have to hit so small and so elusive a target?

But there was a factor which seemed to make the prospect for the infantryman, and for the artilleryman, even blacker.

This one-man tank was, as I discovered, built of ordinary car components. The military ordnance authorities would merely have to supply the armour and machine guns, obtain the tracks from a commercial tractor company, and any civil motor firm could turn the machines out in mass production by the thousand at a cost apiece of less than £400. Thus the primary handicap to the mechanisation of present armies disappears, for these one-man tanks are as cheap as they are simple. The ordinary unprotected foot-slogging infantry soldier costs some £200 a year for his maintenance. The question of comparative cost I will go into again later—for the moment let us return to this vision, or rather reality, of an August day at Camberley, 1925.

A closer look revealed that the machine gun was a dummy, with a revolver fixed in the barrel to fire blank ammunition, while the little

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armoured turret which enclosed the driver was only grey-painted wood—though with a load of stones in a tub heavy enough to be the equivalent of armour thicker than that borne by any present tanks. Other outward crudities in its appearance, viewed at close quarters, suggested a home-made product—though no superficial roughness could hide its formidable power even in the rough, nor cloak the fact that here was a mechanical warrior, armed *cap-à-pie*, which would make worse havoc among ordinary infantry than a mediæval knight loose among a mob of peasants in jerkins armed with pitchforks and staves. The original idea had been born of the inventor's conviction that the largeness and conspicuousness of the present tanks threatened their battlefield supremacy as anti-tank weapons increased in efficiency and penetrative power. To counter this danger it has been long realised among soldiers that four answers exist. First, high speed, which has been the line that English tank designers have followed since the war, and the present Vickers tank of the Army with its average speed of 10–15 m.p.h. and maximum of about 25 m.p.h. has been the result. Second, heavy armour, thick enough to be proof against any armour-piercing bullets or even light shells; the objection is that this course involves a great increase of weight, and consequently not only expense but a limitation on its mobility, for ordinary bridges could not bear the weight of such a "dreadnought" tank. Third, the employment

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of masses of tanks, which by sheer numbers coupled with their speed would submerge like a torrent the opposing anti-tank weapons. Here the obstacle is expense, so long as tanks are costly to manufacture. Fourth, the reduction of the target, a line which infantry, by adopting more and more dispersed formations, has long followed in order to offset the increased effectiveness of modern fire-weapons. The inventor of the one-man tank conceived the idea of combining the third and fourth conditions, by producing a tank so small and yet nimble as to be a difficult target, and built of ordinary motor parts so that it could be turned out by mass production, without special plant, at a cost no higher than an ordinary car. The idea, nursed in his brain for some years, took form early in 1925 and in his leisure evening hours he worked out the design. Then from a six-years-old Maxwell car he took its 20 h.p. motor, and from a Ford one-ton lorry the back-axle. The one costly item, because it had to be specially made, was the track, but even so, his out-of-pocket expenses for the initial machine came only to some £400. One room in his private house was fitted up as a workshop, and here he himself made most of the parts, finally putting the tank together in his garage. By early August it was ready and underwent its first trials, on a stretch of gorse-strewn common outside his garden gate. With mingled hope and fear the inventor essayed the first cross-country test. Doubt was soon dispelled —the machine swept triumphantly over obstacles,

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answered to the helm, and by its performance more than fulfilled his expectations.

Such is the story of the origin of this home-made invention, made by a military engineering enthusiast, in his leisure hours and at his own expense, as a private venture without either official backing or knowledge—yet the result a weapon that, even from the most sober viewpoint, may mark a turning-point in warfare. In the Army these miniature machines are now commonly, if not officially, known by the name of the inventor, Major G. Le Q. Martel, a comparatively young officer of the Royal Engineers. What a vital part this scientific corps has played in the development of mechanical warfare! Foremost, of course, was Major-General Sir Ernest Swinton, well known as the author of "The Defence of Duffer's Drift," and as Ole-Luk-Oie of "The Green Curve," until he became better known as one of the parents of the original tank of the World War. Then there were Major-General Sir John Capper, Director-General of the Tank Corps in the War, and its Colonel-Commandant since, and Major-General Sir Hugh Elles, Commander of the Tank Corps throughout the war, who at the Battle of Cambrai restored the old tradition of generalship by personally leading 380 tanks into action.

With these early years of the tank Major Martel had a close connection, for in the early autumn of 1916, when the first tanks appeared on the battlefields of the Somme, he was Brigade Major at their tiny headquarters. As the tank

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corps grew in strength the staff expanded, and because of Martel's youth a more senior officer was sent as chief of the Tank Corps General Staff, but Major Martel continued as G.S.O.2, and so remained until the Armistice rang down the curtain on the tank's decisive share in the ultimate victory. Of Major Martel in these years of war a good story is told in Colonel Fuller's "Tanks in the Great War," a story which bears on our narrative because it typifies the character of the man, his refusal to be baulked by any obstacle from probing a question to the bottom: "Under me came Major G. Le Q. Martel, D.S.O., M.C., very much R.E. and still more tanks, the man who 'sloshed' friend and foe. One day, in March 1918, I was at Fricourt, then none too healthy. Martel walked down the road. 'Where are you going?' I shouted. 'To Montauban,' he answered. 'I hear it is full of Boches,' I replied. 'Well, I will go and see,' said Martel, and off he moved eastwards."

This blend of cool determination with a scientific spirit of inquiry carried "Q" Martel in pre-war days to many triumphs in the amateur boxing-ring, led him to go through a long apprenticeship in practical motor engineering, and in war made him a happy combination of audacity and calculation. Moreover, the intimate experience he gained in these years of tanks in war, their qualities and limitations, made an exceptional foundation for his post-war experiments, when, holding a staff post in the War Office, he devoted his off-hours in his

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Camberley home to the design and construction of a one-man tank.

Turning from the man to the machine, the first feature which impresses the eye is its diminutive size compared with the Saurian monsters of the war. As already indicated, its bulk is scarcely greater than that of the mediæval knight on horseback, smaller distinctly than the average motor-car. Only 4½ feet wide, 8 feet long, and 5 feet 4 inches high at the top of the little armoured turret, it can go almost anywhere that can be traversed by a pack animal, through woods and up hill-tracks, and under branches, incidentally, that would force a horseman to dismount. It can move across soft and marshy ground, as the pressure under the tracks is little more than 2 lb. per square inch, and its total weight is 2½ tons. The track itself extends only 7 feet, but the over-all length is increased by a tail with two large disc steel wheels. Martel considered that a replica on a small scale of an ordinary tank would be too low to accommodate a man, and as it was impossible to reduce the driver to scale, the alternative was to make the machine unduly high for its length. Raising the centre of gravity meant that the machine would overturn backwards when climbing a steep bank—Ford tractors have done this, and the obstacles they need to climb are much less than those that face a fighting tank.

To lengthen the track was to increase weight and cost—and also to make the target larger, so defeating one of the objects of the miniature

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machine. Therefore the wheeled tail, with long cantilever springs which allow a very large movement, was Major Martel's solution of the problem. When the tank comes up against a bank, the springs allow the wheels to be pushed up out of the way and the tracks ensure the necessary grip on the surface. But if the bank is so steep that the machine is in danger of overturning, the wheels come up against stops and ward off the danger. In addition this tail is used for steering and to prevent pitching when the tank is travelling fast.

The next feature, another point of difference from the ordinary tank, that strikes the eye is that the driver's head projects above the edge of the turret, which has no covered-in top. At first sight this may seem a weak, if not a vulnerable, point in its design. But close inspection reveals that the driver can lower his seat 6 inches in an instant, and then is completely protected against bullets, obtaining his driving view through a visor-like slit in the front of the turret. The reason for this feature of design is that normally the driver shall be able to guide his machine as easily as the chauffeur of a motor-car, to see signals and hear words of command, so that a group of these machines can be controlled like a squadron of cavalry or company of infantry. Some critic might say, "But what about bombs, could not these be pitched into the open interior of the turret?" The answer is that it would have to be a remarkably cool infantryman, a human phenomenon indeed, who would

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stand in face of a tank rushing at him, travelling 300 to 600 yards a minute, and would wait until the tank was close enough for him to throw his bomb. Greater still would have to be his throwing skill to drop a bomb inside the narrow opening on the top of the swift-moving machine! And even if one or two lucky attempts came off, what difference would it make?—for with machines at £400 apiece we should reckon not in dozens but in thousands.

The tank is controlled almost entirely by the feet, one more tribute to the designer's skill, leaving the hands free for firing the machine gun. Here the 1925 knight in armour scores over his forerunner, for not only is the weight of his armour borne for him, but both his hands are free, instead of one being necessary to hold the reins. Further, if he requires to dismount and fight on foot, he needs no horse-holder. Dismount cavalry and you automatically put part of your strength out of action.

Finally, we come to the supreme point of its design—its cheapness of production and maintenance. It is calculated that such a machine should last five years as a minimum under peace conditions, and the track itself as much, on a basis of 2,000 miles a year. Thus the capital outlay would be equivalent to only £80 a year. On the same 2,000 miles a year basis the running costs have been calculated as £30, making a total of approximately £110 running cost for each machine. It is estimated that the upkeep—food, clothing, hay, accommodation—

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of an ordinary soldier in an infantry regiment costs the taxpayer fully £200 a year. Thus by equipping infantry with these tankettes we might have approximately two battalions for every three existing battalions of 1,000 foot —their skin no protection against bullets and shell-splinters, their legs capable of a sustained pace of no more than 3 m.p.h., their handling of their weapons handicapped by physical fatigue and the load of equipment borne on their backs.

Imagine two opposing armies, one with a hundred thousand ordinary infantry, the other with sixty thousand odd mechanical infantry; each infantry battalion of the one army attacked by several hundred of these diminutive "mobile armoured machine-gun nests." What chance would the artillery have of stopping their massed onslaught, what chance the infantry of avoiding the stings of this dense swarm of "wasps"?

A favourite argument of the military conservative is that mechanical vehicles spell mechanical trouble. He points to the breakdown of motor vehicles and tanks in the World War, and reiterates the old fable of the hare and the tortoise in his championship of the horse- and the foot-soldier. Has no commander in the past ever suffered a breakdown in his plans through the failure of his tired horses or leg-weary men to arrive on the battlefield? The pages of military history bear many proofs of such failure. Moreover, the theory that it is essential to arrive on the scene of action with a *complete* force means that the force usually

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misses its opportunity by coming too late. To tie the whole force down to the pace of its slowest and most physically inefficient unit is an absurd theory. Rather do our military commanders need to revise their ideas and realise that a hundred units present at the decisive spot and moment are better than a hundred and fifty, nay a thousand, who arrive late. If only a fraction of a force reach such a spot in time to seize it before the enemy, what matter if the roadside ditches *en route* are filled with broken-down vehicles? That is better than for the enemy to seize it while tardy infantry columns are plodding along the road many miles still distant from their goal.

But the tankette should reduce mechanical handicaps far below World-War standards, and at the same time simplify the maintenance of a mechanical army. The Tank Corps of 1916–18 not only demanded a large recruitment of skilled mechanics, but also made an army dependent on a complex repair organisation, with mobile workshops, in the battle-zone.

With such a simple mass-production machine as the new tankette it should be possible for an army to depend entirely on spare parts in the field, and to relegate all workshops and mechanics to the Base. The tank-men need only be taught how to change damaged parts, not to repair them. Ninety per cent. of the mechanical troubles in war are minor ones, and under this system only when a machine is very badly damaged need it be sent back for repair to the Base workshops.

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The one essential is an efficient spare-part service, and given this the battlefields of the future may revive in a military guise the hoary joke, coined of the Ford, that if part of the machine falls out on the road it can be replaced at the next village from the local ironmonger's store. Moreover, this new tankette is almost as fool-proof as a Ford. The tank-men could ride and fight their machines all day like cavalry, but better. Whereas the cavalryman has to spend hours daily in feeding, watering, and grooming his horse, worried too by the need for finding suitable horse-lines, and the dangers of a stampede, the tank-man need spend but an hour or two a week in tending his mechanical charger, and ten minutes a day would suffice to fill it up with petrol and oil.

. . . . . .

Once the possibilities of test of the original machine had been exhausted, the next step lay with the War Office, who, availing themselves of the chance, took over its upbringing. In this they were fortunate to receive the co-operation of the greatest motor-manufacturing firm in the country. Representatives of the Morris Company witnessed a trial of the machine and were so impressed that they undertook its construction for the War Office. The first measure was the production of a few complete trial machines, properly finished, as was not possible with the rough experimental machine. The engineering facilities which such a firm provides enabled refinements in detail. The 20 h.p. Maxwell

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engine, from a broken-up car, was replaced by one of the new 16 h.p. engines designed by Morris Commercial Cars for light lorries. The old Ford back-axle of the original machine was substituted by an ordinary Morris back-axle, and the grey-painted wooden cockpit by real armour.

Of these experimental Morris-built machines part were one-man tanks and part two-men machines. The variation was made in deference to a large section of military opinion, although the inventor himself was inclined to disagree with this modification, not so much because it increases manufacturing cost as because it increases man-cost. The cost of the tank is so low that the pay, food, clothing, etc., of its driver quite eclipse the first item on the annual budget. Thus on any given sum of money the Army could put in the field these machines in the ratio of seven one-man tanks or four two-men tanks. What are the advantages of the two-men machine? A machine where one man drives while the other fires the machine gun should produce a steadier and more accurate fire; it can also be made capable of a wider arc of fire; the fact that one man becomes a casualty will not imply the loss of the machine; finally, it enables the gunner to dismount and act on foot if necessary more easily than with a one-man machine. Against these advantages must be set the numerical superiority of the one-man machine. And those who prefer the last emphasise the analogy with aircraft and cavalry action. The single-seater fighting aeroplane established the predominance

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over the two-seater, and no one has ever wanted to put two men on one horse, one to hold the reins and the other to fight. The one-man machine is so easy to manœuvre, capable of turning so rapidly and in so small a circle, that to fire in the direction in which the machine is pointed would be almost equivalent to a wide arc of fire, and it avoids the danger that the driver will swerve away from the target just as the gunner is aiming. Above all, as the danger to such machines comes from anti-tank weapons, it is more difficult for these to knock out seven machines than four rather larger ones. To this the "two-men" adherents reply that only an exceptional driver could aim while in motion and that in practice the one-man machine would have to halt in order to fire.

While these manufacturing developments were taking place, another experiment was tried with regard to its military, or rather its naval use. This was the trial of the machine for landing on a hostile shore. The tank was taken down to Gosport, close to the naval base at Portsmouth, and there embarked on an ordinary small naval launch. The only alteration made to this was the fitting of a sloping ramp to let down at the stern. When the tank was on board, the launch put to sea, then turned inshore, and after approaching as close as possible to the beach, anchored and swung round with its stern facing the beach. The ramp was lowered, the little tank climbed down it into the shallow water a foot or two deep, and "waded" ashore under

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its own power. For a moment indeed the trial looked as if it would come to an abrupt end, for the sailors had forgotten to level off the projecting end of the ramp at the launch-end; but the driver, rather than hold up the demonstration, set his mount at the hurdle. Balancing for an instant precariously with its nose in the air, the mechanical charger cleared the obstacle, and came down heavily but securely after its "leap," an unintended proof of its powers and stability.

The beach itself was composed of the mud and shingle that prevail at Portsmouth—many critics would have regarded it as an insuperable obstacle to a tank—but the machine swept up it triumphantly, surmounting a steep bank at the finish. The success of this "amphibious operation" opened a wide vista for the future, and those who recall the corpse-strewn beaches of Gallipoli, where defenceless infantry hung entangled in barbed-wire obstacles, both on the beach and concealed under the water, while Turkish machine guns laid them low in swathes, can only regret that the tankette's birth-date was 1925 instead of 1915.

There can be no question that such machines would endow a landing on a hostile shore—rightly regarded as the most perilous of gambles—with a speed, security, and striking power hitherto unknown. Here again the new form of offence requires no elaborate preparations, no building of special craft from which to disembark them—but, as was proved, any ordinary naval launch will serve. What would not

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Napoleon have given for such a swift and simple means of invasion, when he waited with the Grande Armée in his great entrenched camp at Boulogne, watching the narrow strip of channel that separated him from his goal—England—in the vain hope that he might secure a long enough interval for the undisturbed passage of his fleet of cumbrous flat-bottomed barges? To come to the present, what would not the Spaniards have given for such a means when they attempted their landing, for days imperilled, at Alhucemas Bay? With a force of such machines they might have trapped Abdel Krim in his headquarters or at least struck before he could collect his force to oppose them. For the French, too, who were forced to place ever-increasing reliance on their relatively ineffective and obsolete Renault tanks to subdue the Riff posts, what a boon would such an incomparably more handy machine, cheap to provide and mass-produced, have been to them in clearing the Riff sharp-shooters out of their nests—in hills where only a pack-mule could go, and a bullet-proof pack-mule was necessary.

Since its experimental début the Martel-Morris machine has been joined by a baby-brother, the still more diminutive Carden-Loyd. This likewise has two types, a toad-like two-seater, squat and low, and a one-man machine, narrower but higher off the ground, like the Carden cycle-car that used to be a familiar sight on our roads, and with the driver protected by a thin steel turret-shield. If radically different

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from the two-seater in appearance, the gait of the single-seater, when bouncing rapidly over the ground, has an irresistible reminder of the frog. A further development is a wheel-cum-track model, which runs at some 30 m.p.h. along the road on its three pneumatic-tyred wheels, its spidery tracks off the ground, until by a mere pull on a side-lever the driver converts it for cross-country travel.

No one would pretend that any of these miniature machines are yet perfect. The Martel-Morris had a tendency to "wobble" at speeds over 15 m.p.h. on a road, although having a sure grip on the rougher surface which it met when travelling across country. The short length of its track is a handicap when a wide trench is met, even though its mobility gives it the chance to find a way round. The same limitation applies still more to the Carden-Loyd, and the difficulty of carrying adequate armour on such a diminutive machine suggests that in its present form it is more suitable as a reconnaissance than as a fighting machine.

Yet all handicaps appear petty beside the indisputable fact that here are machines so cheap to produce as to offer the chance of decreasing vulnerability by their smallness and their numerical quantity—reducing the target by dispersion and multiplication. At least they would carry the infantryman through the danger-zone far quicker and with far more protection than his legs and his cloth uniform give him. If such a machine is not the final model, it may

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well prove the prototype of the mobile cuirass of future men-at-arms. And thus with the added element of protection it may be the means of reviving the mounted infantry ideal which was current after the Boer War, and which the Mongols in the thirteenth century had translated into achievement. Heavy cavalry and heavy infantry were alike powerless to counter their all-conquering advance, as with the lightness and liquid mobility of a flood they swept over the Asiatic and European continents until they had submerged all the land from the Pacific to the Baltic. There is no parallel in all history to the rapidity and extent of their conquests, and the cause deserves reflection by all who are entrusted with the remaking of modern armies.

There is still another aspect of the mass-production tankette, or mobile cuirass, which calls for mention. The battlefield supremacy of such machines implies the political supremacy of the great industrial nations whose civil motor industry has the capacity to swamp a rival army by a vast output at short notice. Would the lengthy preparations of militarist Powers be of any avail in face of such a fact?—for it is the great peace-loving and peace-preserving nations, Britain and the United States, who possess this industrial capacity and therefore latent military supremacy. The disarmament of the inferior industrial nations becomes automatically accomplished, and no conferences are needed to confirm this immutable decree.

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CHAPTER VI

THE HUMANITY OF GAS

THE Preparatory Commission on Disarmament at Geneva approved last year a series of questions by Lord Robert Cecil in regard to chemical warfare, and submitted them to the technical sub-committee. These questions covered the possibility of ordinary chemical factories being adapted for the production of poison gases, the means and apparatus likely to be employed for spreading such gases, their discharge from aircraft, their effect on closely populated districts, and the adequacy of gas-mask protection, even if feasible in such areas.

After prolonged investigation the technical sub-committee had to reply that "chemical factories, especially dyeworks and factories connected therewith, can be very quickly adapted to the manufacture of poisonous gases," that "it is impossible to prevent or hinder the manufacture of these chemicals in peace-time," that "all aircraft fitted with smoke projectors could very easily make use of that apparatus for the purpose of spreading poisonous gases," that "spraying devices could be improvised from ordinary trade articles with great rapidity," that "a bombardment by poisonous substances would probably produce much more serious effects upon a town than a bombardment by

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explosives," that "there is no technical means of preventing chemical warfare."

If these answers were a cold douche of reality, the fact of the questions being put forward was a significant commentary on the solemn agreement come to at the Washington Conference in 1921. The signatory Powers not only bound themselves to a prohibition of gas, but in a rhetorical outburst the Report declared: "It undertakes further to denounce the use of poisonous gases and chemicals in war, as they were used to the horror of all civilisation in the war of 1914–18." The truth is, one suspects, that every new weapon has been anathema until it became familiar, but none has been abandoned once its superior effectiveness to the old has been proved.

When the Spartan Archidamus saw a dart fired from a machine of war just brought from Sicily, he exclaimed: "O Hercules, the valour of man is at an end." When the Chevalier Bayard, the pattern of chivalry, captured musketeers or others who used gunpowder he had them put to death, although to honest wielders of the brain-bespattering battle-axe or flesh-carving sword he was the kindliest of captors. But the moral prohibitions of Archidamus, Bayard, and their like have not prevented the long-range projectiles superseding the short-range *arme blanche*. And the chemical weapon is but another stage in this natural course of evolution.

Now that a more rational atmosphere has

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replaced that of the war years, when outraged conventionalism and interested propaganda combined to brand any novel weapon as an atrocity, it may be well to investigate the actual result of gas warfare, in order to discover if a moral prohibition has any basis in fact.

The British casualties in the war from bullet, shell, and bayonet were 2,797,693, of whom 879,000 died—a proportion of nearly one dead to three wounded. Our gas casualties were 180,983, of whom only 6,062 died, or one in every thirty. The American list is even more illuminating, for, coming late into the war, they experienced the effect of gas warfare at its height. The report of the Surgeon-General of the United States Army stated that out of 187,586 casualties due to bullets, shells, or the bayonet, the deaths were 46,449—roughly one in four. Out of 74,779 due to gas, the deaths were 1,400, or less than one in fifty. Thus, according to this medical testimony, a man in the British Army disabled by gas instead of by bullet or shell had ten times as much chance of recovery, and in the American Army twelve times as much.

The difference between the British and American ratios is largely explained by the fact that our troops experienced the first chemical attacks when the chlorine gas used at Ypres in April 1915 caused a death-roll of nearly 5,000, or one in four of those affected. A novel weapon which had almost as high a proportion of deaths as the conventional bullet or shell was naturally called barbarous, and obscured from the popular

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mind the much-mitigated damage of the improved gases employed later.

What is the clear deduction from these statistics? That "poison gas" is from ten to twelve times as humane a weapon as bullets or high explosive. This would be so even with acutely painful forms of gas. For what man would not prefer an interval of suffering so long as life and not death lay at the end?

Furthermore, before a Select Committee of the United States Senate in 1923, Dr. Francine, Chief of the State Tuberculosis Clinic in Philadelphia from 1907 until he went to France as "consultant-in-gas" to the Fourth United States Army Corps and chief of staff to the great gas hospital at Toul, stated under oath: "Of all methods of warfare, gas is the least inhuman and the most effective." He flatly denied that gas caused tuberculosis as an after-effect, and said that, on the contrary, it would tend to prevent it and to assist the cure of those who were tuberculous when gassed! This unexpected result is corroborated by the Surgeon-General's report, which stated that the percentage of tuberculosis cases among men who had been gassed was 2·45 per 1,000. "Since the annual rate for tuberculosis among enlisted men serving in France in 1918 was 3·50, and in 1919 4·30 per 1,000, it would seem to be apparent that tuberculosis occurred less frequently among the soldiers who had been gassed than among those who had not been."

The British official medical report on the

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war stated: "There is happily every reason to think that only a very small percentage of gas casualties of the war will suffer any permanent disability."

During the years 1914–18 the cry was often raised that science had made war more barbarous than ever before. It is beyond understanding how anyone with even an acquaintance with history could have made such a comment. The bloodiest battle of modern times bears no comparison in the proportion of slain to the days when the sword was the executioner. As in bloodshed a Tannenberg was but the pale shadow of a Cannæ, so in blood-lust even the Balkan wars were mild compared to the Wars of Religion, and these in turn to the Mongol wars. The truth is that warfare has become progressively less lethal and more humane. And to-day the obstacles to this continued progress come from the sentimentalists, who, first at Washington and now at Geneva, are striving to maintain the prohibition on gas. Their unconscious object is to preserve for the battlefields of the future the beneficent effects of high explosive, which shatters the limbs, turns flesh into pulp, and gives the stricken but one chance in three of recovery—a weapon which, unlike gas, cannot be used in a non-lethal form, and destroys not only life but property. Devastated areas are not the least of the evils of war, and the development of air bombardment promises to increase the destruction of factories, dwellings, and communications. High explosive, in fact, destroys

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the economic foundations of the subsequent return to peace.

Moreover, killing is not the object of war, but at best only a clumsy means to an end—which is the subjugation of the hostile will to resist. Leaving aside the probable line of future attack direct against the enemy people, it is sufficient to say that even in the military sphere the paralysis or demoralisation of the enemy forces is as effective as, and more humane than the slaying of them. By the exploitation of mustard gas, as used in 1917–18, it would be possible to immobilise an army; by the use of gases developed since then it would be possible to render the enemy's troops helpless for many hours—long enough to round them up.

Thus, as I pointed out in "Paris, or the Future of War": "Self-interest as well as humane reasons demand that warring nations should endeavour to gain their end . . . with the infliction of the least possible permanent injury to life and industry, for the enemy of to-day is the customer of to-morrow. . . . To inflict widespread death and destruction is to damage one's own future prosperity, and, by sowing the seeds of revenge, to jeopardise one's future security. Chemical science has provided mankind with a weapon which reduces the necessity for killing and achieves decisive effects with far less permanent injury than in the case of explosives. Gas may well prove the salvation of civilisation from . . . collapse in case of another world-war."

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Nor is it only for such an eventuality that gas promises to do for warfare what chloroform has done for surgery. Most of the Powers represented at Geneva have colonial possessions, and with them the ever-present danger of native risings or border forays. By banning gas the civilised Powers condemn themselves to expeditions costly in life and money, and in these days, when most tribesmen have rifles, if not machine guns, such risings are increasingly difficult to quell, as we found in Waziristan and the French in Morocco. If the conventional soldier thinks it "sporting" to fight the tribesman with his own weapons, the taxpayer at least might question the wisdom of such a policy.

In the sphere of internal security, gas gives the forces of law and order an instrument as helpful as it is humane. To quell a riot by firing on the mob is so damaging an expedient that action is often postponed too late, and, if taken, makes martyrs of the victims. A mob is usually but a collection of fellow-citizens, temporarily insane through the excitement generated amongst a crowd. Where to fire would be to risk a legacy of bitterness, a discharge of tear-gas would give the opportunity for passions to cool, and a rioter with his eyes temporarily streaming with tears could only be an object of ridicule, not a candidate for martyrhood. Tear-gas is better than an Amritsar and more humane even than a baton charge.

Those apparent sentimentalists, but actual brutalists, to whom the word "gas" is still

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anathema may find the fact worth noting that the United States has been the one country to develop this humanising force in quelling disorder. First used against criminals in the cities and the boll-weevil on the plains, it is now being used with satisfactory results against lynch-mobs in the South. May the proof of its humane effectiveness in quelling disorder pave the way for its recognition as the means of lessening the evils of war! To continue the prohibition on gas is not only to maintain the horrors of high-explosive warfare, but is futile. As well might the courtiers of Canute urge him to resist the tide. For it is the only weapon which is a commercial product, manufactured from chemicals which are an essential requirement of peaceful industry, and so cannot be banned effectively. Those nations who refuse to recognise it merely put themselves at the mercy of some other less scrupulous, and with the growing realisation of the truth about gas the cry of "atrocity" would fall flat. The delegates at Washington in 1921 had the excuse of being too close to the war to see its innovations in true perspective, but those at Geneva have no excuse for allowing illogical prejudices to outweigh a reasoned deduction from the lessons of history and the statistics of the war.

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CHAPTER VII

THE NAPOLEONIC FALLACY

For more than half a century the General Staffs of the Great Powers have based their doctrines on the Napoleonic method of "absolute war"—that the national object in war can only be gained by decisive battle and the destruction of the main mass of the enemy's armed forces. In a chapter which is likely to provoke strong objections from the orthodox schools of thought, it is as well to set forth unmistakably the foundation on which their theory of the conduct of war is based. Even the most hair-splitting critic cannot dispute the general accuracy of the above statement without throwing overboard all the textbooks and regulations produced by the General Staffs of Europe for several generations past.

It is the purpose of this study to suggest that the Napoleonic doctrine is a wrong one, that in following it the Great Powers have narrowed and distorted their whole conception of war, and that to this fundamental error is due the general state of financial, commercial, and moral decline and even bankruptcy to which the nations of Europe, in greater or less degree, are now reduced—as was France after Napoleon. At the same time the endeavour will be made, in all humility, to indicate a wider and more scientific conception

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of war and its true object. Thus, should the millennium of universal peace fail to arrive, and nations still continue to settle by an appeal to arms questions which vitally affect their policy, it may be that they will learn to wage war in a manner less injurious to the interwoven fabric of Western civilisation, and incidentally to their own ultimate prosperity, than was the case in the War of 1914–18.

But to achieve this more scientific and economic military policy it is necessary that public opinion should be awakened to the fallacies as well as the dangers of the present theory of war—the disastrous legacy of Napoleon.

While professional experience in any department of life is usually the surest channel to executive skill and technical knowledge, the concentration of the mind on the technical problems of a profession has a natural tendency to cause the vision to be narrowed and the attention mainly devoted to the task of perfecting the existing means and methods. By all means let us pay tribute to the tactical and administrative ability displayed in, for example, the autumn offensives of 1918 in France, Palestine, and Macedonia. But when we take stock of the appalling cost of the war in lives and money and our national exhaustion, we are surely justified in questioning whether the strategic aim and direction were sound. What was the object of our military strategy? The memoirs and dispatches of the military leaders responsible for the formulation and execution of it reveal that it was the

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destruction of the enemy's armed forces in the main theatre of war. The attainment of this object took us over four years, cost this country nearly a million lives and an expenditure of roughly £5,000,000 a day. The military chiefs, to whom we have referred, claim that but for the collapse of Russia and political interference the war might have ended a year or so sooner. Even if we go so far as to accept this supposition, the human and financial cost would still have been a terrible strain on our resources and national well-being. It is surely clear that any further wars conducted on similar methods must mean the breakdown of European civilisation.

It is, however, because of the general apathy towards military questions on the part of the ordinary citizen that this doctrine has so long passed unquestioned. Few Englishmen are now willing to hand over their religious or political conscience into the keeping of "authority," yet by their lack of interest in military questions they do in fact relinquish any check on a policy which affects the security of their lives and livelihoods to an even greater extent. For, when war bursts upon the nation, it is the ordinary citizens who pay the toll either with their lives or from their pockets. By taking an active interest in the broad aspects of national defence, and so regaining control of their military conscience, they might avoid paying the exorbitant and accumulated interest due to past indifference which brought them to the verge of bankruptcy in the last war.

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If the citizens of a nation were asked what should be the general aim of the national policy, they would reply, in tenor if not in exact words, that it should be such as to guarantee them "an honourable, prosperous, and secure existence."

Apart from a few self-seeking individuals, no normal citizen of a democracy would willingly imperil this by a resort to war. Only when he considers, or it is suggested to him convincingly, that his honour, prosperity, or security is endangered by the policy of another nation, will he consent to the grave step of making war.

When, however, the fateful decision for war has been taken, what does common sense tell us should be the national object? Surely to ensure a resumption and progressive continuance of what may be termed the peace-time policy, with the shortest and least costly interruption of the normal life of the country.

What stands in the way of this? Obviously, the determination of the hostile nation to enforce its contrary policy in defiance of our own desires and aims. To gain our object we must therefore change this adverse determination into a compliance with our own policy, and the sooner and more cheaply, in lives and money, we can do this, the better shall we be assured of a continuance of our national prosperity. The aim of a nation in war is therefore to subdue the enemy's will to resist, with the least possible human and economic loss to itself.

If we realise that this is the true object, we shall appreciate the fact that the destruction of

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the enemy's armed forces is but a means—and not necessarily an inevitable or infallible one—to the attainment of the real object. It is clearly not, as is so often claimed, the main object or objective in war. Once we have cleared the air of the fog of catchwords which surround the conduct of war by grasping that in the human will lies the source and mainspring of all conflict, as of all other activities of life, it becomes transparently clear that our goal in war can only be attained by the subjugation of the opposing will. All acts such as defeat in the field, propaganda, blockade, diplomacy, or attack on the centres of government and population, are seen to be but means to that end, and instead of being tied to one fixed means, we are free to weigh the respective merits of each, and to choose whichever is most suitable and most economic, i.e. that which will gain the goal with the minimum disruption of our national life during and *after* the war. Of what use is decisive victory in battle if we bleed to death as a result of it?

We shall examine, further on, the alternative means which are available under modern industrial and political conditions, but before doing so it is advisable to show how the present limited conception of war arose and how it gained so strong and so fatal a hold on military thought. The decisive influence was exerted not by Napoleon himself, but by his great German expositor, Carl von Clausewitz. He it was, in the years succeeding Waterloo, who analysed and codified the Napoleonic ideas and methods. He has been

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the master at whose feet have sat for a century the military students of Europe. From him, the German army in particular drew the inspiration by which they evolved their stupendous, if foundationally unsound, structure of the nation in arms. It achieved its triumph in 1870, and as a result all the Powers hurried to imitate the model, and to revive with ever greater intensity the Napoleonic tradition, until finally the gigantic edifice was put to an extended test in the years 1914 to 1918—with the result that in its fall it has brought low not only Germany, but, with it, the rest of Europe.

Thus, because of the unsoundness of their foundations, Clausewitz's theories ended by bringing his Fatherland into a more impotent and bankrupt state even than when it was under the iron heel of Napoleon. Clausewitz's was truly "a house built on sand." Yet, despite his main miscalculations, he had a wider understanding of the objects of war than most of his disciples. Clausewitz did at least recognise the existence of other targets besides the armed forces. He enumerated three general objects—the military power, the country, and the will of the enemy. But his vital mistake was to place "the will" last in his list, instead of first and embracing all others, and to maintain that the destruction of the enemy's military power was essential to ensure the remaining objects. Similarly, the other outstanding military thinker of the century before the Great War, Ferdinand Foch, admitted the existence and wisdom, under certain conditions,

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of other means, but as with Clausewitz these reservations were forgotten, and his disciples remembered only his assertion that "the true theory" of war was "that of the absolute war which Napoleon had taught Europe."

This was but human nature, for the followers of any great teacher demand a single watchword however narrow. The idea of preserving a broad and balanced point of view is anathema to the mass, who crave for a slogan and detest the complexities of independent thought.

Exponents of the Napoleonic theory have in four bloody and ruinous years of war been able to test their doctrine to the uttermost, and if they have not learned its limitations, the nations at large have, for they have felt in their own persons and pockets the dire plight in which it has landed them.

Yet how strong is the grip of this concept of war can be seen in the post-war writings and utterances of certain admirals and generals. Thus, for example, in a discussion in "The Times" on the subject of air warfare, a distinguished admiral pointed out that as "the first and greatest principle of war" was the destruction of the enemy's armed forces, the aircraft of this country in case of war must have as their real objective the enemy aircraft.

Here we see not only the Napoleonic theory reincarnated in a new element—the air—but also an argument based on a misunderstanding of one of the most used—and abused—terms in the language of military science. The admiral had

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not even grasped the difference between the term used to signify the constant truths of wars and that which denotes the forms of their practical application, which are subject to change. The "destruction of the enemy's armed forces" is a *specific and concrete act* or acts, whereas a principle is essentially a *general and abstract truth* (e.g. economy of force, security) which governs the concrete actions in war. How can we expect leaders who do not grasp the difference between a principle and a means (by which the principle is put into effect) to arrive at an understanding of the wider aims of war in contrast to the narrow objectives which professional tradition has instilled into them?

It is not surprising that military writers and teachers in recent generations were deaf to any other than the theory of "absolute war," and poured scorn on the objects of Napoleon's predecessors, forgetting that they at least gained the purpose of their policy, whereas his ended in ruin.

One and all spoke and wrote with contempt of these eighteenth-century strategists, though they included such men as Marshal Saxe, whose writings bear the impress of a mind perhaps more original and unbiased by traditional prejudices than any in military history. Here is how Foch in his "Principes de la Guerre" contrasts the exponents of the rival theories: "The same kind of war was characterised in the following way by Marshal de Saxe himself, albeit a man of undeniable ability: 'I am not

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in favour of giving battle. . . . I am even convinced that a clever general can wage war *his whole life* without being compelled to do so.' Entering Saxony in 1806, Napoleon writes to Marshal Soult: 'There is nothing I desire so much as a great battle.' The one wants to avoid battle his whole life; the other demands it at the first opportunity."

So that even a man of the intellectual calibre of Marshal Foch thinks solely of the tangible proofs of military victory, with never a reflection as to which man best fulfilled ultimately the national object of an honourable, secure, and prosperous future.

We see him greeting with approval the dictum of Clausewitz, "Blood is the price of victory. You must either resort to it or give up waging war. All reasons of humanity which you might advance will only expose you to being beaten by a less sentimental adversary."

In the last sentence we see the recurring delusion of the Continental military mind that the opposition to the Napoleonic theory must necessarily be dictated by mere sentimentalism. It disregards the possibility that it may be due to a far-sighted political economy.

There are signs, however, that Marshal Foch, in contrast to his less intellectual compeers, has gained from recent experience a wider conception of the aims of war and the true object of military policy. In a statement since the war on the subject of air-power, he gave the weighty and illuminating judgment that "The poten-

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tialities of aircraft attack on a large scale are almost incalculable, but it is clear that such attack, owing to its crushing *moral effect on a nation, may impress public opinion to the point of disarming the Government and thus become decisive.*" Here is a dramatic and far-reaching break with the "armed forces" objective. Perhaps also his connection with the Ruhr policy was evidence of a grasp of the possibilities not only of war without bloodshed, but war without hostilities—the object, more effective than the enemy's military power, being control of the rival's industrial resources.

"Saul is numbered with the prophets!" The champion and embodiment of the Napoleonic doctrine appears to have cast it overboard. We see an indisputable recognition that two other objectives exist—one moral, the other economic.

Having sought to expose the limitations of the doctrine that the primary objective in war is the main armed forces of the enemy, it is now proposed to give a few examples from history of the successful use of the moral objective.

First, let us look at Alexander, one of the greatest Captains in all history—and who, unlike Napoleon, attained his ultimate political object in its entirety. At Arbela, his crowning victory, his acts clearly show his understanding of the fact that the destruction of the Persian Army was not the decisive means to his goal. By reason of the autocratic nature of the Persian power, the enemy's will to resist centred in the person of Darius. His personal capture or overthrow

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would automatically carry with it the subjugation of the armed forces. Thus we see Alexander, in face of the huge length of the Persian array, moving his small force opposite to the left flank of Darius's line, foreseeing that he will in this way draw upon himself the cavalry and chariots of the left wing—which cover the immediate flanks of Darius's own position in the centre. Then instead of attacking the outer flank of the Persian line, as would seem natural, Alexander suddenly inclines inwards and launches his own picked body of Companion Cavalry into the gap where the Persian left wing hinged on to the centre. Through this he drives straight at Darius, who, seized by panic at this personal threat, flees, and with his disappearance the Persians' will to resist is automatically broken. Countless instances might be quoted of the decisiveness of a blow against the personal objective, among them the Battle of Hastings.

For our next example we turn to the Punic Wars. In the struggle between Rome and Carthage for the domination of the ancient world, the political conditions of the rival states alter the nature of the moral objective. The two mother-cities with their government and population form the vital points, although Carthage offers a secondary objective in the personality of Hannibal. The Carthaginian leader ranks in history with Napoleon, yet similarly he appears to lack the gift of supreme strategic vision. His objective is the armed forces of the enemy, but even the annihilating victory of Cannæ does not

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bring him to his goal, because Rome itself stands unmastered. The apologists for Hannibal are legion, but they cannot obscure the plain fact that by his failure to gain Rome he ultimately lost Carthage. Scipio Africanus, his ultimate conqueror at Zama, suffers from the misfortune that his own claims to fame have been overshadowed by his adversary's dramatic victories and heroic stand in Italy for so many years, which appeal to the sentimental imagination. But Scipio's appreciation of the true objective was surely more profound ?

Instead of seeking a decision in Italy where his troops would have suffered under the moral influence of Hannibal's repeated victories in that theatre, Scipio, in face of the most weighty protests, embarks for Carthage. His immediate object is to free Italy, and he realises that a threat to Carthage will so act upon the *moral* of the citizens that they will recall Hannibal. The result proves the soundness of his judgment. Then, by striking at the resources of Carthage in Northern Africa, he accomplishes the next step towards the subjugation of the Carthaginian will, and so to Zama, the flight of Hannibal himself to the East, and the capitulation of Carthage. Scipio's combination of the moral, military, and economic weapons triumphs over the " armed forces " theory of Hannibal.

For a third, and modern, example of the superiority of the moral objective over the " armed forces " theory, we may cite the campaign of 1814 which ended in Napoleon's abdi-

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cation and relegation to the Isle of Elba. Never perhaps in his whole career did Napoleon's genius shine so brightly as in that series of dramatic victories in February and March 1814, by which he staggered the Allies, until in pursuit of the delusive military objective he overreached himself. He moved east to fall upon Schwarzenberg's rear, drawn on by the theory of destroying the main mass of the enemy's forces. By this move he uncovered Paris, and the Allies marched straight forward to gain the moral objective—the nerve-centre of the French will to resist. Paris was the prey of war alarms and fatigue, in the very conditions for a moral detonator to wreck Napoleon's hold. The royalist de Vitrolles tells the Czar Alexander that "People are tired of the war and of Napoleon. Consider politics rather than strategy, and march straight on Paris, where the true opinion of the people will be shown the moment the Allies appear." Captured dispatches also bore witness to the underlying discontent of the capital. The Czar summons a council of war. Barclay de Tolly, the senior, urges that the forces should be concentrated, to follow and attack Napoleon. General Toll affirms that there is only one true course, to "advance on Paris by forced marches with the whole of our army, detaching only 10,000 cavalry to mask our movement."

Barclay disagrees and argues the example—so hackneyed in later years—of the occupation of Moscow. Toll points out that the effect of the seizure of Paris will be decisive economically and

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morally, and that there was no true parallel between the cases of Moscow and Paris—the nodal point of France.

The Czar decides for Toll's plan, the army sweeps on Paris and enters in triumph after but the slightest resistance, while Napoleon is winning delusive successes in Lorraine. When the news from Paris reaches him, he thinks frantically of a counter-march, but the moral germ, disseminated by the occupation of Paris, spreads even among his generals and troops. Too late! So great are the moral repercussions of this act, that in a brief space Napoleon, with the people and his satellites turned against him, is forced to an unconditional abdication.

There are also plenty of negative examples to prove that the conquest of the main armed forces of the enemy is not synonymous with victory. History has no more complete victories than Cannæ and Sedan, yet the one failed to bring Hannibal to his goal, and the other was only consummated when Paris fell several months after—although the main armed forces had been overthrown in a few weeks.

There are a parallel and a contrast between 1870 and 1914. For in 1870 the German objective was Paris, and while in pursuit of it the French Army fell into their hands. In 1914 the German objective was the French Army, and in pursuit of this objective they missed both it and Paris.

After this perforce brief historical survey, let us turn to consider the means by which the moral object, of subduing the enemy's will to resist,

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can be attained. These means can be exercised in the military, the economic, the political, or the social spheres. Further, the weapon by which they are executed may be military, economic, or diplomatic—with which is included propaganda.

As war is the subject of this book, the diplomatic and economic weapons, except in a military guise, are outside our purview. There appears little doubt, however, that the economic weapon in the struggle between rival national policies during so-called peace has possibilities still scarcely explored or understood. Again, the military weapon can be wielded in the economic sphere without any open state of war existing. In the Ruhr we saw the French aiming to subdue the German will to resist by a military control of the latter's industrial resources, and with the further motive of a moral disruption between the German states as a result. What, however, are the ways in which the military weapon can be employed to subdue the enemy's will to resist *in war?*

For the Navy there are two means: the destruction of the opposing naval forces, and a blockade which will cut off supplies from overseas. The second means is exercised by the control of communications or by a direct closure of enemy ports. In the World War the British blockade was carried out by a combination of these two methods, whereas the German submarine blockade necessarily aimed at the former result only. The objection to the blockade

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weapon rests in its slowness to exert a decisive effect, and because of this time-factor it is usually detrimental to the economic prosperity of the country which exercises it—in greater or less degree according to the other conditions, political, economic, and military, which also bear on policy.

For the Army, the possible means are, besides the destruction of the enemy's military power, the control of communications and of industrial resources, the occupation of the centre or centres of government and population, the capture or overthrow of individuals who are the mainspring of the opposing policy, and the intimidation of the people by methods of terrorism—an act which, even if temporarily successful, usually reacts among civilised nations to the detriment of the aggressor—by stimulating the will to resist, or by so outraging the ethical code of other nations as to cause their intervention.

Armies, however, suffer under one serious hindrance to any of these less destructive means of subduing the hostile will. Being tied to one plane of movement, it is rarely possible to reach the enemy capital or centres of industry and communication without first disposing of their main army, which forms the shield of the opposing government and nation. It is because of this age-long limitation that the short-sighted, if natural, delusion arose that the armed forces themselves were the real objective. Clausewitz and his successors were the false prophets mainly responsible for exalting this superficial deduction

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to the binding authority of a law of warfare, and for fastening its fatal yoke so firmly on the necks of the people—its slaves and victims.

From this false assumption it was the natural sequence that the combatant troops who composed the armies should be regarded as the objective to strike.

Thus mechanical butchery became the essence of war, and to kill if possible more of the enemy troops than your own side loses was the sum-total of this military creed, which attained its tragi-comic climax on the Western Front in the World War.

The absurdity and wrong-headedness of this doctrine should surely have been apparent to any mind which attempted to think logically instead of blindly accepting inherited traditions. War is but a duel, between two nations instead of two individuals. A moment's unprejudiced reflection on the analogy of a boxing-match would be sufficient to reveal the objective dictated by common sense. Only the most stupid boxer would attempt to beat his opponent by battering and bruising the latter's flesh until at last he weakens and yields. Even if this method of attrition finally succeeds, it is probable that the victor himself will be exhausted and injured. The victorious boxer, however, has won his stake and can afford not to worry over the period of convalescence, whereas the recovery of a nation is a slow and painful process—as the people of these isles know to their cost.

A boxer who uses his intelligence, however,

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aims to strike a single decisive blow as early as possible against some vital point—the chin or the solar plexus—which will instantaneously paralyse his opponent's resistance. Thus he gains his object without himself suffering seriously. Surely those responsible for the direction of war might be expected to use their intelligence as much as a professional pugilist?

The first gleam of light on the horizon of military thought appeared in the closing stages of the World War. Recent publications have revealed that in 1918 the Tank Corps General Staff put forward a scheme, originating with its Chief, Colonel Fuller, to strike at the nerve-centres of the German Army instead of at its flesh and blood—the fighting troops. Reflection on the disaster of March 1918 showed that its extent was due far more to the breakdown of command and staff control than to the collapse of the infantry resistance. A scheme was evolved to launch a fleet of light fast tanks, under cover of a general offensive, which should pass through the German lines and, neglecting the fighting troops, aim straight for the command and communication centres in rear of the front. By the annihilation of these the disorganisation and capitulation of the combatant units were visualised. The plan was submitted to the Imperial General Staff in London, approved and forwarded by them to Marshal Foch, who adopted it as the basic tactical idea for 1919.

This appreciation of the fact that the enemy command is the true military objective, and not

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the bodies of the actual soldiers, marks a great advance—or recovery—in military thought.

While the tank has widened our opportunities for striking at this truer military objective, there is a tool which is even more far-reaching in its possibilities—the aeroplane.

Aircraft enable us to jump over the army which shields the enemy government, industry, and people, and so strike direct at the seat of the opposing will and policy. Provided that the blow be sufficiently swift and powerful, there is no reason why in a few hours, or at most days, from the commencement of hostilities the nerve-system of one of the contending countries should not be paralysed. A modern civilised state is such a complex and interdependent fabric that it offers a target highly sensitive to a sudden and overwhelming blow from the air. We all know how great an upset in the daily life of the country is caused at the outset of a railway strike even. Business is disorganised by the delay of the mails and the tardy arrival of the staff; the shops are at a standstill without fresh supplies; the people feel lost without newspapers—rumours multiply and the signs of panic and demoralisation make their appearance. Perhaps an even more striking parallel may be found in the disruption of the whole life of Japan in the recent earthquake. An air attack of the intensity that is even now possible would be likely to excel even this event in its disorganising and demoralising effect. Imagine for a moment London, Manchester, Birmingham, and half a dozen other

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great centres simultaneously attacked. The business localities and Fleet Street wrecked, Whitehall a heap of ruins, the slum districts maddened into the impulse to break loose and maraud, the railways cut, factories destroyed. Would not the general will to resist vanish, and what use would be the still determined fractions of the nation, without organisation and central direction?

Victory in air-war will lie with whichever side first gains the moral objective. If one side is so foolish as to waste time—more the supreme factor than ever before—in searching for the armed forces of the enemy, which are mobile and capable of concealment, then clearly the static civil centres of its own land will be paralysed first—and the issue will be decided long before the side which trusted in the "armed forces" objective has gained even a military success.

If, on the other hand, the decisiveness of the moral objective be admitted, is it not the height of absurdity to base our military forces on infantry, which would—even if unopposed—take weeks to reach Essen or Berlin, for example, when aircraft could reach and destroy both in a matter of hours.

To this use of aircraft to gain the moral objective there are, however, three possible objections, one military, one economic, the third ethical. The military objection is embodied in the question—"What of the enemy's action?" The reply is manifold—the enemy cannot, as on land,

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bar the way by a passive defence; for active intervention the enemy must approach equality of strength and even then the dimensions of the air, the speed of aircraft, and the cover afforded by darkness offer far greater opportunities of strategic surprise than in land warfare. Further, air-fighting is naturally more indecisive because of its fluidity and because an opposing air-fleet offers no fixed target nor fixed communications at which to strike. To seek out the enemy's air forces as the primary aim would mean not only waste of time and dissipation of strength, but absence of result. Indeed the only chance of bringing the enemy to battle under favourable conditions would be by striking primarily at a moral objective such as his centre of government and sources of life. The only qualifying factors are that if the rival air-fleets were too nearly equal in strength and preparedness they might be held in check for fear of reprisals, and, secondly, that gravity gives the fighting aircraft an inherent advantage over the bombing aircraft. The existence of these two factors is the main justification for still maintaining land forces, although the latter have also the assets of being able to destroy the ground bases of the hostile aircraft and of exercising a more direct control of the arteries and sources of supply on which the life of a hostile nation depends. In an occupied country aircraft can control only by threat of destruction, but land troops by mere grip.

The economic limitation is that by destroying

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the enemy factories and communications we may so cripple his commerce and industry as seriously to reduce his post-war value as a potential customer. There is a certain weight in this argument, for if one lesson stands out clearly from the last war it is that the commerce and prosperity of civilised nations are so closely interwoven and interdependent that the destruction of the enemy country's economic wealth recoils on the head of the victor. The obvious reply, however, is that even the widespread damage of a decisive air attack would inflict less total damage and constitute less of a drain on the defeated country's recuperative powers than a prolonged war of the existing type.

The ethical objection is based on the seeming brutality of an attack on the civilian population, and the harmful results to the aggressor of any outrage of the humane feelings of the neutral peoples. The events of the last war have, however, in some measure acclimatised the world to the idea that in a war between nations the damage cannot be restricted merely to the paid gladiators. When, moreover, the truth is realised that a swift and sudden blow of this nature inflicts a total of injury far less than when spread over a number of years, the common sense of mankind will show that the ethical objection to this form of war is at least not greater than to the cannon-fodder wars of the past.

But self-interest as well as humane reasons demands that the warring nations should en-

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deavour to gain their end of the moral subjugation of the enemy with the infliction of the least possible permanent injury to life and industry, for the enemy of to-day is the customer of the morrow and the ally of the future. To inflict widespread death and destruction is to damage one's own future prosperity, and, by sowing the seeds of revenge, to jeopardise one's future security. Chemical science has provided mankind with a weapon which reduces the necessity for killing and promises decisive effects with far less permanent injury than in the case of explosives. Gas may well prove the salvation of civilisation from the otherwise inevitable collapse in case of another world-war. Even with the lethal gases of the last war, the use of which was described as barbarous by conventional sentiment, statistics show that the proportion of deaths to the numbers temporarily incapacitated was far less than with the accepted weapons such as bullets and shells. But chemistry can now give us non-lethal gases which may overcome the hostile resistance, and spread panic, for a period long enough to reap the fruits of victory, but without the lasting evils of killing or destruction of property.

It is a strange reflection on the all too frequent lack of vision and common sense that the opposition to the use of gas in war comes from an alliance between those unwonted bedfellows, the traditional militarist and the sentimental pacifist.

Moreover, we still find that, in defiance of reason and history, the governments are again

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striving by international legislation to prohibit the use of gas and to confine the blows of aircraft to the traditional military objectives. It can be said of them, as of the Bourbons, that they have "learnt nothing and forgotten nothing."

The humanisation of war rests not in "scraps of paper," which nations will always tear up if they feel that their national life is endangered by them, but in the enlightened realisation that the spread of death and destruction endangers the victor's own future prosperity and reputation.

While we have endeavoured to show the importance of the air weapon as a means to subdue the enemy will to resist, and hence the folly of taking the armed forces as the sole objective, we realise that further scientific developments may again modify our conclusions as to the means by which the moral objective is best gained. It may prove impossible to reach the moral objective without battle, but the positive and negative examples from history serve to show that, even so, the best way to bring the enemy's armed forces to battle under conditions favourable to oneself is by striking at the moral objective, as did Scipio and Moltke, and that to take the armed forces as the objective may be to chase a will-o'-the-wisp and merely grasp disaster, as did Napoleon in 1814 and the younger Moltke in 1914. Battle is at best but a means, a move on the chessboard of war, which is most fruitful when combined, as by Scipio, with moral and economic moves, so that each reacts on the

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others. Let us never again confound the means with the end: the goal in war is the prosperous continuance of our national policy in the years *after* the war, and the only true military object is the moral one of subduing the enemy's will to resist, with the least possible economic, human, and ethical loss to ourselves.

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PART II

REJUVENATION

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CHAPTER VIII

THE ARMAMENT OF INFANTRY

THE infantry entered upon the war in 1914 as in name the decisive arm; they finished it as in fact a subordinate arm. The infantryman entered the war as a simple rifleman; at the end he was a human Christmas-tree. He had not only the hostile machine guns and barbed wire to contend with, but the burden of his own equipment, and even if the first had not prevented him moving, the second would hardly have allowed him to move.

The infantry tactics of 1914 were relatively simple, built up round the infantryman's rifle and bayonet; and although their offensive power proved inadequate, they at least allowed infantry to move and manœuvre for a brief time until trench warfare set in. Then, in the attempt to cure immobility by inoculation with the germ of immobility, the infantryman was dosed successively with endless varieties of weapons—hand-grenades, rifle-grenades, smoke-grenades, heavy machine guns, light machine guns, trench-mortars, even trench-daggers! By the end of the war he was a picture of the stage brigand, with weapons of different kinds and patterns protruding from every part of his body.

The result was not to increase the offensive power of infantry—which depends not only on

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fire-power, but on protection and mobility—but to limit such offensive value as he still retained. For the value of infantry in the present Army, as of tank-marines in the future, rests solely in their *loco-mobility*—their ability to move over every sort of ground and to clear every yard of any locality. After the war the rebuilders of the Army understood the brake on mobility caused by this complex equipment more quickly than that caused by the hostile machine guns. One by one they discarded these war-produced weapons, until the infantry platoon, apart from a few valuable smoke-grenades, was reduced to its pristine simplicity of rifle and bayonet and one other weapon—the light automatic, or Lewis gun. This weapon, introduced during the war, had been gradually increased in numbers, until two of the four platoons of a company were armed with it. Reconstruction demands more thought than reduction, and thus perhaps naturally this organisation was retained without change, and without regard to the fact that it inevitably complicated the tactics of infantry. Yet if enemy action is the direct hindrance to mobility, complexity of organisation is a powerful indirect brake.

The trouble came to a head when, in 1925, the Army, for the first time since the war, carried out extensive training which culminated in Army Manœuvres.

Not least among their negative lessons was that of the breakdown of the present platoon organisation and tactics when tried out in large-

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scale exercises. In company training theory had been admirably fulfilled, and the platoons were really handled in accordance with the tactical doctrines of the post-war manuals. But when companies were merged into a brigade or divisional attack, as on Manœuvres, all these canons went by the board, and the bewildered spectator saw the attack degenerate into a hybrid of 1914, 1916, and the Crimea. Thus, the final grand assault on Quarley Hill, on the last day of the Manœuvres, suggested that part of the Army, losing the veneer of modern science, had gone back to Balaclava—forgetting that in face of machine guns density of numbers simply means density of corpses. Instead of the platoons acting as a combination of independently manœuvring sections, they became so many thick clusters of men, human stop-butts had the defenders been firing real bullets. And the root cause of this return to the cannon-fodder methods of a past age lay in the too difficult tactical rôle of the modern platoon—due to its hybrid composition. It is illogical to expect the platoon commander, a junior officer or N.C.O., to combine the action of four radically dissimilar sub-units, where the experienced company commander has only to co-ordinate four homogeneous sub-units. This anachronism means, in plain language, that the more experience an officer has the simpler is the tactical task allotted to him, under our present organisation. To remove this radical flaw it was argued, as an axiom of organisation, that the sections of each platoon should be similar in

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composition and armament. But a compromise experiment was first tried—that the company should be composed of three platoons of riflemen and one of Lewis gunners, i.e. concentrating all the light automatics of the company in a single platoon.

This meant a return to a rifle basis for the ordinary platoon, and savoured of reaction. To set back the hands of the clock is rarely a wise military policy. One is reminded of the attempt to revive the bow during the reign of the musket. Difficulties are rarely overcome by pretending that they do not exist.

The experiment raised a question as to the proper rôle of the Lewis gun—a question on which the whole issue turns. Is the Lewis gun to be considered as an automatic rifle, or is it to be regarded merely as a light machine gun which can be used farther forward than the Vickers machine gun? Surely its true purpose is as an automatic rifle, for the Vickers, properly handled, can carry out the rôle of the machine gun better than any other small arm.

The Lewis gun was adopted as essentially a weapon of mobility in contrast to the true machine gun, a weapon of stability. Its purpose was to strengthen the mobile fire-power of the platoon, to give the forward infantry greater fire-effect than the rifle endowed them with, rather than to add a new supporting weapon. And the experimental change, while apparently simplifying the tactics of the platoon, tended to complicate and weaken the general tactics of the infantry.

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Even the simplification of the platoon's rôle might be more illusory than real. Picture a company with two rifle platoons forward, each on a 250 yards frontage, the third rifle platoon following as company reserve. With a frontage of 500 yards, and a depth of approximately the same, which the Lewis-gun platoon commander would have to cover, it is obvious that over such a wide area personal control of the various Lewis-gun sections could not be maintained. Thus we should find sections from the Lewis-gun platoon sent to co-operate with the various rifle platoons under whose commander they would come in practice. The result would thus be that the forward platoons would virtually consist of the same number of Lewis guns as at present, with double the present strength of riflemen, so making control more difficult even than at present. On outposts the platoon frontage is still more extended—perhaps 500 yards—and if the platoon commander is to protect this front with only rifle sections, he will have to use almost every man, and then only get a small weight of fire-power, whereas with the light automatic a few men possess a stopping-power out of all proportion to their number.

The rifle platoon commander would therefore have to be reinforced with Lewis guns, and as they were not a permanent part of the platoon, difficulties would arise over feeding, and the platoon commander might not use them to the best tactical advantage.

One of the most common arguments for revert-

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ing to platoons of riflemen is that the assaulting strength of the present platoon is inadequate, and that an assault to be effective must have greater bayonet strength. This is a reversion to the theory of numbers, which ever flourishes on peace-time fields, where bullets are absent and the hard lessons of war are forgotten. A study of the French regulations between 1870 and 1914 is illuminating on this question, for the first post-war doctrine of 1875 approximated far more closely to the practice of 1918 than any of its successors. Indeed, with each subsequent new regulation density of numbers was increased until the French infantry went to war in 1914 trained on a doctrine which cost them appalling casualties in the early battles. So also with the Germans.

On this point I would quote from two soldiers of great practical experience in training infantry for war and handling infantry in war. The first, General Sir Ivor Maxse, Inspector-General of Training in the last, victorious phase of the war :

" We used to use that dreadful phrase ' building up the firing line '—in other words, crowding the men, mixing up the units and putting forward men's bodies merely to stop bullets without any idea of manœuvring. When you come to analyse you discover that it is a mere phrase for over-crowding the ground. By ' putting weight into the attack ' we ought to mean adding more fire-power from infantry units, tanks, artillery, and aeroplanes."

The second, a letter from Colonel John Brown,

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commander of the East Midland Brigade which had the honour of being chosen to represent the Territorial Army in the last Army Manœuvres:

"We are getting back to talk of the weight in the attack, so that the final assault can be made with the bayonet. Is this a practical proposition? Can unarmoured men make a charge into a defensive position, whether entrenched or not, where any of the defenders are left able to use their rifles or automatic weapons? For it must be remembered that when a unit charges, the whole of the supporting fire must momentarily cease, and even if the charge is only for fifty yards the men are at the mercy of the defenders until they actually get into the defence.

"It would appear to me from personal experience that the only possibility of making a successful charge would be where the defenders were either demoralised or all out of action—in which case, whether by charge or not, the attackers would be able to take the position.

"I remember one occasion, November 27, 1917, my battalion was holding a front of some 3,500 yards in front of the village of Wilhelma, Palestine, covering the road from Jaffa to Jerusalem. The Turks tried to break this line. The strength of the attacking Turks was about seven times that of my battalion, and they had six batteries of artillery against one. Our defensive position consisted of hastily dug, but well-sited, section fire-pits. During the day there were three distinct enemy attacks. Each in the last resort was held up by our small-arms fire;

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in no instance was our defensive line pierced. It was simply the additional fire-power which the Lewis guns gave us that enabled the attack to be held. The last attack was shortly before dusk, and when it was brought to a stand-still a counter-attack by the reserve company pushed the enemy back about one mile.

"The Lewis guns during that day were the salvation of the defence, providing a weight of fire which would not have been available if we had had to rely on rifles only. This and other experiences incline me to the view that the Lewis gun, much as it falls below the standard of the automatic rifle required, should be retained as a platoon weapon."

Finally, Colonel Brown argues, contrary to the normal view, that the light automatic is both more suitable and more effective for part-trained troops than the rifle. There has been a tendency to hold that the introduction of the Lewis gun complicated the task of the Territorial infantry as compared with the days when their standard weapon was the rifle.

"Our Expeditionary Force of 1914 consisted of long-term soldiers who had been fully trained with the rifle to an average of fifteen aimed shots per minute. Such results cannot be achieved by the Territorial Army, nor by newly-trained men in the case of a national war, when great expansion would be necessary. We saw the wonderful stopping-power of the skilled riflemen of that Expeditionary Force at Mons, Le Cateau, and Ypres, and such stopping-power can only be

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given to the Territorial Army by arming it with automatic rifles. One to each section is the ideal.

"It may appear that I underrate the value of the rifle, but I think, if you come to look at all the difficulties of peace training and its adaptation to war conditions, it must be accepted that there is small chance of an average rifle section being able to produce fire-power of fifteen aimed rounds a minute. The control of a number of men is more difficult than of a single firer. The fact that the rifle depends entirely on the individual emphasises all the human errors, the inaccuracy due to excitement and the physical condition of the men. In contrast, the automatic rifle is commanded by one man, is more accurate because of the stability given by the tripod, allows of much greater fire-power, and, owing to its narrow frontage, can often be fired from positions where the rifle section could not work.

"Shortly after the war I found difficulty in getting the men to take an interest in the Lewis gun, awkward to carry compared with a rifle, and I overcame this by a demonstration. We took some eighty-five men, many of whom had never fired a Lewis gun before, on to the range. They were given the opportunity of firing the ordinary Lewis-gun course after the rudiments of the gun had been explained on the firing-point. Seventy-nine of these men qualified."

In considering these arguments of Colonel Brown it is worth recalling that the French, who,

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with their short-service Army, have problems akin to those of our Territorial and possible national Armies, base their infantry organisation on the light automatic. Their fire-unit is the *groupe de combat*, thirteen strong, and their teaching is that all its members only exist in relation to the *fusil mitrailleur*, according to whether their individual rôle is "to move it, serve it, feed it, or protect it." And although their standard of rifle shooting is low, they are most effective with the light automatic. If we are to accept the view that the light automatic is essential in the platoon, two improvements are clearly imperative. We must cure the present complexity of platoon tactics, so for this the logical step is to equip every section with a light automatic as its basic weapon. Secondly, we need to restore the mobility of the sections—all must be equally and definitely mobile fire-units—and for this we need to equip them with a lighter weapon, such as the Browning, which weighs only 19 lb., compared with the 26 lb. of the Lewis gun. The ultimate goal may be to arm each infantryman with an automatic rifle. The difficulty is ammunition supply, but this can be overcome if the infantryman of to-morrow goes to battle in a tankette, which he can leave at will when required to fight over rugged ground or to clear hostile trenches.

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CHAPTER IX

THE DRILL OF INFANTRY

FEW students of war will question the importance of drill. The idealist or the anarchist, who places his trust unreservedly in the uncontrolled impulses of the human will, may object to the restraint implied in the term, but history shows that even the most radical-minded have soon found the necessity for it once they are placed in any position of authority, whether in the military or in the political and industrial spheres. These latter forms of activity are mentioned because it should be appreciated that drill is not merely military, but, in its widest sense, covers every form of organised process. It is in fact but the method of executing a movement repeatedly so that it may develop into a habit, thereby enabling it to be carried out instinctively and instantaneously with a minimum expenditure of energy and with a maximum of efficiency —executive skill of any kind is primarily the fruit of habit.

Military drill in particular has a dual object: First, to instil obedience, self-control, cohesion, quickness, and alertness—all of which qualities may be summed up in the phrase "the disciplined activity of the individual." Second, to develop the mobility and flexibility of units for battle.

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Our existing system of parade drill is substantially the same in principle as it was in the eighteenth century, although it has been modified considerably in detail at various periods. At that time the line, column, and close-column formations and movements, which we still use on the parade-ground, were the actual tactical formations and movements of the battlefield. Thus in those days, and for several generations after, the drill system was fundamentally sound, because it fulfilled both the objects of drill—the disciplined activity of the individual and the manœuvring flexibility of the unit *to meet battle conditions.*

But the development of modern fire-weapons rendered obsolete these formations and movements, and, although somewhat tardily, and only after paying a heavy price, the nations eventually abandoned them for war. They still retained them, however, for use on the drill-grounds of peace, and it is only since the last war that the French and other Armies have finally discarded them.

Our Army still keeps the old system, and it is the purpose of this article to bring out the reasons why a change is advisable, and to suggest a method by which the drill system can be brought up to date with the least possible friction and innovation.

Those in authority have long tacitly recognised that our present drill bears no relation to battle formations and movements by prescribing radically different methods for use in war. By so

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doing, however, it is surely clear that we have perforce sacrificed the second of the two objects of drill—that of developing the flexibility of units for battle. On reflection, there would appear a spice of Gilbertian absurdity in the idea of solemnly inculcating a set of evolutions which are no longer applicable to war conditions, and then teaching a different system for use on the battlefield. It is surely a violation of the law of economy of force to cause this double expenditure of energy and time. The more technical weapons become with the advance of science, the less adequate grows the all-too-brief time available for training. Not only, however, have the troops to waste a portion of this in learning obsolete movements, but there is a further danger—that these wrong ideas may become so much impressed on their minds and muscles that they may revert to them instinctively in battle. It was a widely recognised phenomenon in the last war that when the stress of action dulled the reasoning faculties, troops were liable to fall instinctively into the dangerous habits learnt on the parade-ground.

Perhaps the most frequent and worst lapse due to this imbued tendency was that of sacrificing the maintenance of direction to the instinct of alignment. The history of the war shows several major occasions on which the idea of dressing by a flank resulted in a disastrous loss of direction, while the minor instances were numberless.

If, as is generally admitted, the sense of direction proved one of the most difficult qualities to

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develop, may it not be because the sense of alignment is that first instilled in the recruit, and because movements in line are the staple of close-order drill ?

Whilst pointing out these considerations, I would emphasise that just as I am a firm believer in the value of drill, similarly I advocate no violent break with the existing methods. Evolution, not revolution, is the keynote of the reforms here advocated. In an army, changes must necessarily be well-considered, for the stake—national security—is too great to encourage reckless gambling.

But whilst it is recognised that changes hold an element of risk, the refusal to change weapons or habits when they have become obsolete is fatal, as history teaches us in the downfall of many nations whose vaunted security was swept away by the first blast of reality.

Now, it is at least clear that the next war must either be more mobile than the last, which attained in its middle period the zenith of immobility, or it will cease to be war and become a mere state of impotent exasperation. The motive underlying all subsequent inventions, or rather their military development, has been to dissipate this condition of stagnation, and every recent advance in military *matériel* has been in the direction of greater power and speed of movement. A necessary corollary of this increase in general mobility is an augmentation of the mobility of such proportion of infantry or land-marines as are still retained. How is

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this to be attained? Lighter equipment and mechanical transportation are some of the technical means by which this ideal is being sought. While these demand expenditure on research and equipment, there is one method which demands no additional outlay. It is the method by which many of the Great Captains of the past won their triumphs—by quickening the disciplined flexibility of the infantry in deployment and manœuvre.

The introduction in our official manual of a universal system of battle drill—for which I was responsible—is evidence both of the need and the attainment of a notable advance in the flexibility of the infantry units. The myth that numbers alone are the decisive factor has been rudely dispelled, and military authorities generally appreciate that quality, not quantity, is the keynote of the future, as it has ever been with the professional armies, from Cunaxa and Arbela down to Plassey and the Peninsula.

If quality is our goal, then it is surely clear that economy of energy and time must be our guiding star, and our drill as well as our tactical training must be based on battle conditions and movements. If we divorce discipline from training, we violate one of the essential axioms of preparation for war.

Let us therefore modernise our close-order drill, *by evolution from battle drill*, and with the idea of *direction* as its keynote.

When, in 1917, I originated and worked out the now accepted system of battle drill, I had

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in mind the possibility of its adaptation to close-order drill, and thus, in some measure, the ground has been prepared for the further reforms which are here advocated.

The aim is not only to modernise the present drill, but also to simplify it by cutting out a large number of obsolete and redundant movements, and to achieve as great a similarity as possible between those executed by the various scales of units.

Those who have grown up with the present drill system are so much accustomed to it that they perhaps tend to overlook the vast aggregation of movements which prove a stumbling-block in the training of citizen soldiers, both with Territorials in peace time and when armies are hurriedly raised in times of national emergency. In both cases time is ever the decisive factor, and the hours wasted in acquiring redundant movements are a brake on the production of trained troops.

It must be remembered that the drill-book is not for the Regular Army alone; indeed, if we accept the principle of seeking "the greatest good of the greatest number," the needs of the citizen forces should predominate. In actual practice at the present time the line battalions do little company or battalion drill, devoting such time as can be spared from tactical and weapon training to battle and ceremonial drill.

But the citizen soldier, as is perhaps the tendency with the semi-amateur, regards the drill-book as a bible, and as he sees that the bulk

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of it is devoted to the old close-order drill, practises the latter religiously, sandwiches in a spice of ceremonial—badly done because the movements are too many and too complex for any save the true ceremonial troops—and then finds no time left to practise battle drill. The frequent result, as the writer has observed, is that undue time is spent on drill to the curtailment of tactical and weapon training, and with little profit because the movements are over-numerous and obsolete.

Parade-ground drill is but the spade-work of modern training, yet we find that in "Infantry Training," vol. i, no less than 201 pages, roughly 50,000 words, are devoted to this form of drill. If we can shorten this in any degree, we shall not only save valuable time, but also avoid the danger of mental indigestion in assimilating this complex mass of instruction. Taking company and battalion drill, for example, the purely drill parts of the present chapters comprise 87 pages, or some 9,000 words.

Again, in the present company and battalion drill there are 27 and 37 types of movements respectively, totalling several hundred possible movements. Only one of these is a movement beginning and ending in fours, i.e. a deploying movement that could be used in war. All the rest are movements in obsolete lines (including column and close column of lines), with a few from fours into line or the reverse. By excising the Waterloo class of movements, which bear no relation to war conditions, the suggested

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system contains only 13 and 17 types of movements respectively—all of which start and end in fours and so are capable of being used as deploying movements in war. As these afford as many as 150 possible movements, they are surely sufficient to ensure flexibility, while the types are not too many to master quickly.

Further, the scheme fits in with the fundamental ideas of our present doctrine of infantry tactics, depth and direction. Depth implies that every unit down to the platoon shall be divided into an advanced portion and a reserve portion; it is but a military form of the familiar proverb, "Do not put all your eggs into one basket." Direction is synonymous with "maintenance of the objective," the first of the principles of war catalogued in "Field Service Regulations," so that its importance needs no emphasis.

Yet not a single movement in the drill-book instils either axiom, at least not in a form that is related to war conditions. The few movements in fours make the company (or platoon) deploy into a single line of platoons or sections, i.e. breadth without depth, the very antithesis of present tactics.

The Scheme Outlined.—In brief, the scheme is built up on two bases, the first being the formation in fours. This is the accepted formation for movement, so that it involves no radical change, whilst it instils the essential ideas of direction and readiness for instant movement. The other basis is square formation, which is not only the most common tactical formation, but

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inculcates the vital lesson of depth. Diamond formation, though useful in battle drill, is less suitable for close-order drill, besides multiplying the movements unnecessarily, and so is not used.

The majority of the suggested movements are, in brief, the square-formation movements of battle drill compressed in space (i.e. with intervals and distances reduced) and adjusted to the more machine-like requirements of close-order drill.

Platoon Drill.—The normal formation of the platoon will be in column (i.e. fours), ready for instant advance. For inspection, only, the platoon will be turned into line facing a flank.

The platoon can also be formed, and execute movements, in square formation of sections, or line of sections.

It will fall in by sections, each in fours. Each section numbers from left to right by fours successively—for marches and for company and battalion drill two sections may be numbered off together, in order to complete the fours. When a platoon is turned into line facing a flank for inspection, the even numbers in each row of four will move in forming two-deep.

Drill movements in fours, file, or single file will be carried out as in squad drill; in square formation of sections, and in line of section columns, as in company drill.

Short lateral movements to gain ground to a flank may be carried out in line, the men keeping in their fours. It is suggested that to instil the idea that such movements in line are but momentary, the command LEFT (or RIGHT) TURN should

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not imply forming two-deep as well; when required, as for inspection, the order FORM TWO-DEEP should be given.

Company Drill.—The usual drill formation of the company, whether at the halt or on the move, will be in *close square formation* (i.e. two lines of platoons in fours) at 7 paces interval and distance. (See Plate 1.) The march formation on roads, or when a narrow frontage is required, will be column of route.

For inspection the command LEFT (or RIGHT) TURN, FORM TWO-DEEP, will be given. The company will then be in two lines, each in double rank. (See Plate 2.)

The left will be the normal flank of direction, and from which advance or deployment will be made, unless otherwise ordered.

Main Movements.—Although the detail, and the platoon commanders' orders, are omitted here to avoid wearisome length, it is hoped that the plates will serve as a guide to these. The first movement is given in full as an example, and to show that equal precision can be attained as in the present drill.

1. *Forming Company Column*[1] *from Close Square.* (See Plate 3)

ADVANCE (OR RETIRE) IN COLUMN

The commander of the leading left flank platoon (usually No. 1) will give: "No. ——

[1] With the disappearance of the obsolete column or close column (of lines) the term "column" will imply a unit in fours or file—as it already does in battle drill and tactical training.

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COMPANY DRILL.

Plate 1.

Company in close square.

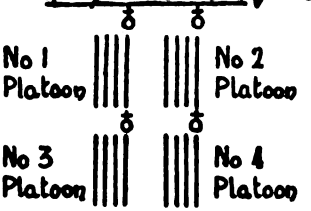


Plate 2.

Company turned into line for inspection.

LEFT-TURN, FORM-TWO-DEER

Plate 3.

Forming column [of route]

ADVANCE IN COLUMN.

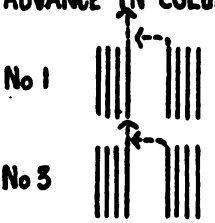


Plate 4.

Forming close square from column.

REFORM—SQUARE

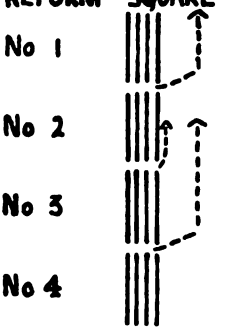


Plate 6.

CHANGE DIRECTION—LEFT

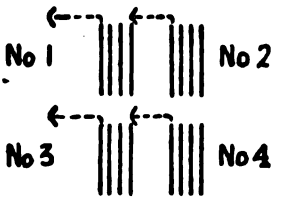


Plate 5.

FROM THE CENTRE, REFORM—SQUARE.

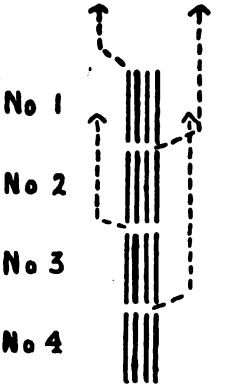
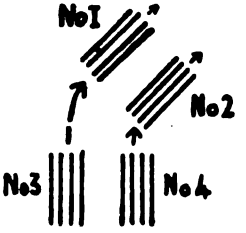


Plate 7.

CHANGE DIRECTION—HALF RIGHT



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Platoon, quick—march." As soon as the rear of this platoon is almost level with the head of the platoon on its right, the commander of the latter will give: "No. —— Platoon, left—wheel, quick—march," followed by the order "Right—wheel," to bring his platoon in the wake of the first. As soon as the 2nd platoon has formed into the column, the commander of the left rear platoon will give: "No. —— Platoon, quick—march," and the 4th platoon will follow as above. If the order is given on the move, the 2nd, 3rd, and 4th platoons will mark time until they can form into the column. If the order is prefaced by "FROM THE CENTRE," the platoons execute a half-wheel inwards in turn.

2. *Re-forming Close Square from Company Column.* (See Plate 4)

RE-FORM SQUARE

If at the halt, the 2nd and 4th platoons will incline and move in quick time; if on the move, the 2nd, 3rd, and 4th platoons double into place.

The movement may be varied by forming square to the left, from the centre (inclining outwards), or by ordering other than the normal intervals and distances.

3. *A Close Square on the Move changing Direction to a Flank.* (See Plate 6)

CHANGE DIRECTION—LEFT (OR RIGHT)

Each platoon wheels to the left, and the change of direction is then complete (with the formation

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unaltered). The simplicity of this movement compared with the present changes of direction in line, column, or close column is self-evident. The leading platoon on the pivot flank automatically becomes the platoon of direction.

4. *A Close Square on the Move partially changing Direction.* (See Plate 7)

CHANGE DIRECTION—HALF RIGHT

The leading right flank platoon simply half-wheels, and the corresponding left platoon doubles round until in alignment.

The rear platoons, on reaching the same point, act similarly.

Extra Movements

5. *Forming a Single Line of Platoon Columns from Close Square.* (See Plate 8)

FORM LINE OF PLATOONS

The movement can be carried out at the halt or on the move, and varied by forming on the left, outwards (see Plate 9), or at other than the normal intervals.

6. *Re-forming Close Square from a Single Line of Platoon Columns.* (See Plate 10)

REFORM—SQUARE, NOS. —— AND —— PLATOONS LEADING.

7. *Forming a Single Line of Platoon Columns from Company Column.* (See Plate 11)

The movement can be varied as in (5).

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8. *Forming Company Column from a Single Line of Platoon Columns*

While the left flank, or named, platoon leads off, the remainder wheel in its wake.

9. *A Single Line of Platoons changing Direction to a Flank.* (See Plate 12)

The platoon on the named flank wheels and moves on, while the remainder double round into alignment. The movement can also be carried out at, or to, the halt. A partial change of direction is executed similarly.

10. *Forming Echelon from Close Square* (See Plate 13)

The two platoons on the flank named advance first, and when they have gained the required distance, the two on the other flank advance.

11. *Re-forming Close Square from Echelon*

12 and 13. *Forming Echelon from Line of Platoon Columns and vice versa*

14. Short lateral movements to a flank can be carried out by giving the simple command RIGHT (or LEFT)—TURN, followed by LEFT—TURN in order to face the front again. When on the move, however, it is preferable, because saving time, if the order PLATOONS, HALF LEFT—WHEEL is given, followed by HALF RIGHT—WHEEL when the required lateral movement is completed.

15. Deployment into, and movements in, section columns can also be practised.

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Plate 8.

Forming a line of platoon columns from close square.

FORM LINE OF PLATOONS

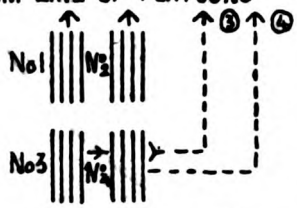


Plate 9.

FORM LINE OF PLATOONS-OUTWARDS

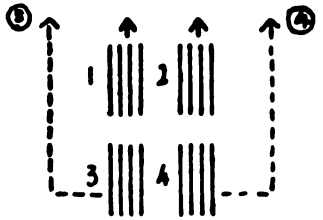


Plate 10

Reforming close square from a line of platoon columns

REFORM-SQUARE, NO I & 2 PLATOONS LEADING.

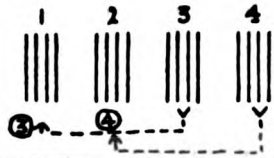


Plate 11.

Forming line of platoon columns from company column

FORM LINE OF PLATOONS

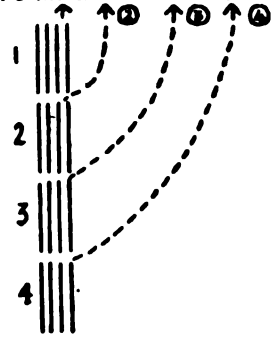


Plate 12.

A line of platoon columns changing direction to a flank.

CHANGE DIRECTION – RIGHT

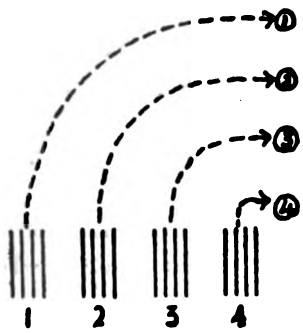
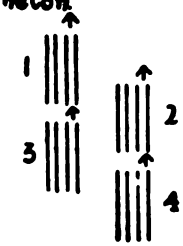


Plate 13.

A close square advancing in echelon



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16. While the normal inspection formation will be obtained on a simple LEFT (or RIGHT)—TURN, FORM TWO-DEEP, the company may then be formed in one line, e.g.

ON THE LEFT—FORM LINE.

Nos. 1 and 3 Platoons stand fast, while 2 and 4 are moved up into alignment on their left. An alternative and simpler method still is to march in company column into position and then face the flank and form two-deep.

Battalion Drill.—The normal drill formations of the battalion will also be in close-square formation, either of company columns or of platoon columns. The former, termed for brevity "square of companies," will be formed of two lines of companies in fours at 17 paces interval and 7 paces distance. The latter, termed "square of platoons," will comprise four lines of platoons in fours (i.e. each company distributed in close square) at 7 paces interval and distance. (See Plate 14.)

The battalion will usually form up in square of platoons.[1] For inspection or address the troops will be turned to face a flank, thus approximating to the present mass formation, except that each of the companies will be in two lines instead of four.

Movements.—Company column movements will be carried out as are movements 1–14 of company drill.

[1] It is suggested that the term "mass" might be used for this formation, which replaces the old "mass."

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In addition there are four types of movement from and into "square of platoons":

1. *Forming Battalion Column from Square of Platoons.* (See Plate 14)

The platoons of the leading left flank company move off in turn as in company drill, and the other companies follow in succession.

2. *Re-forming Square of Platoons from Battalion Column.* (See Plate 15)

IN PLATOONS, RE-FORM—SQUARE

The second and fourth companies disengage at the double to the right, the third company doubles forward—each company re-forming square as it comes into position. The movement can be carried out at the halt, or varied as in company drill.

3. *Changing Direction to a Flank.* (See Plate xxv, Fig. 1, "Infantry Training," Vol. I)

On the order, every platoon wheels, and the movement is complete.

4. *Partially changing Direction.* (See Plate xxv, Fig. 2, "Infantry Training," Vol. I)

Each line of platoons acts as in company drill, aligning on the pivot flank.

The Possibility of More Extensive Reforms.—To avoid complication, and to keep this study within reasonable limits, the question of a re-formed squad drill has been left untouched. This, however, might also be considerably sim-

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plified and curtailed. If we recognise the paramount idea of direction and abolish all but the simplest movements in line, we could eliminate a considerable part of the "sections" dealing with squad drill in single rank and two ranks.

Again, the scheme outlined may be objected to as unduly conservative by those who would favour a more drastic cleavage with the past. I admit the implication, but in armies it is easier to advance by gradual steps than by extensive bounds. It is true that the French have gone much further in the idea of direction. For movements on the battlefield, single file is now in most armies the principal formation of the little fighting group of infantry—the section in our Army, the *groupe de combat* in the French, the squad in the American. The French group always moves in single file, even on the march, until it extends into skirmishers. Since their section, which corresponds to our platoon, comprises but three groups, it follows that the French column of route is by threes abreast.

To follow the French example might more fully meet the demands of modern conditions, but it would involve greater changes, and would also entail that the platoon had a slightly different method of deployment from that of the company and battalion. The latter point would of course be balanced by the simplification due to doing away with the delay involved in shaking out from fours. Among the pros and cons of such a change are: that if the platoon commander wishes to give instructions to the section

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Plate 14.

A battalion in square of platoons forming column of route.

ADVANCE IN COLUMN.

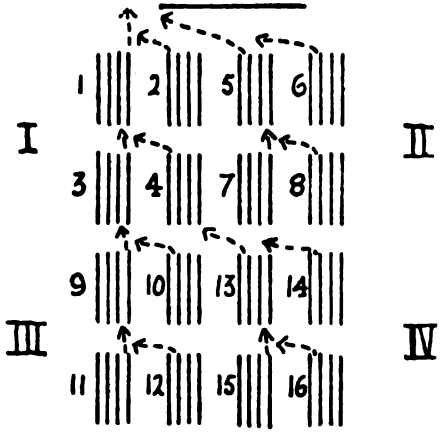
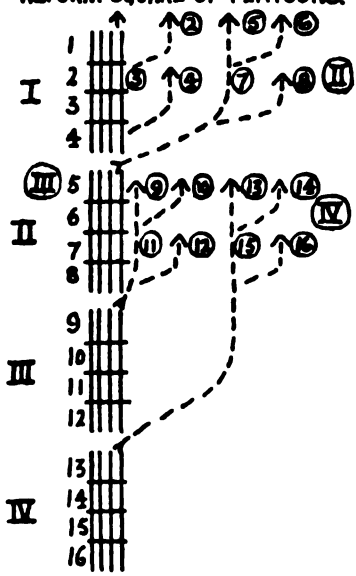


Plate 15.

REFORM SQUARE OF PLATOONS.



Platoon drill based on sections in single file.

Plate 16.

Platoon formation.

Sections No 1 2 3 4

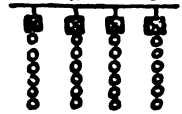


Plate 17.

Platoon deploying into square formation (movement in progress.

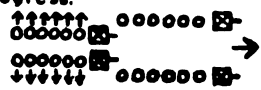
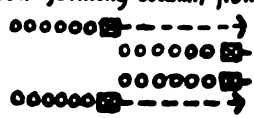


Plate 18.

Platoon forming column from square



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commanders on the march, he has all four next to him; for them to pass on these instructions to the men of their sections is perhaps less convenient, though they can command their sections better both by order and example. Again, a man cannot talk with his "pal" in the section as easily as when marching alongside of him; on the other hand, single file may stimulate fellowship and co-operation between the sections.

To meet this question of further reform, therefore, a scheme is outlined below for making single file the basic formation of the section, for drill and marching, as well as when deployed.

SCHEME FOR A PLATOON DRILL BASED ON SINGLE FILE AS THE NORMAL FORMATION OF THE SECTION

The normal formation of the platoon will be with the four sections abreast, each in single file. (See Plate 16.) The platoon will fall in this formation, and each section will number from front to rear. For inspection, only, the platoon will be formed in one or two ranks, facing a flank.

Drill Movements

1. Advancing, retiring, wheeling, inclining, will be carried out as in squad drill. The section commander will lead his section and each man of the section will cover off exactly the man in front of him. The four section commanders, who will form the first row of four, will align

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themselves on the left flank section commander, and each successive row of four will align themselves by the left similarly.

2. *Deploying into Square Formation*

FORM—SQUARE

The left and right flank sections will continue to advance. The two centre sections will mark time until the leading sections are clear, and will then take two side steps outwards and follow in rear of the left and right flank sections respectively. (See Plate 17.)

The movement may be made at the halt or varied by ordering larger intervals and distances. In this case the sections will make an incline outwards until the required interval is obtained.

If the order ON THE LEFT (or RIGHT), FORM—SQUARE be given, the two sections on the named flank will lead on, opening to the required interval, while the two sections on the other flank mark time and then wheel in rear of the leading sections.

3. *Forming Platoon Column from Square Formation*

ADVANCE IN COLUMN

The two leading sections will close in together, leading on, while the two rear sections double forward, forming into column of route on the outer flanks of the leading sections—the right rear section on the right and the other on the left. (See Plate 18.)

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4. Changes of direction when in square formation will be carried out as in company drill.

5. Deployment into a line of section columns, at any desired interval, can be made by giving: OPEN TO——PACES INTERVAL, FROM THE RIGHT (LEFT, or CENTRE). If on the move, the sections will simply incline until at the required interval. If at the halt, the additional command OUTWARDS—TURN, or REMAINDER, LEFT (or RIGHT) —TURN will be given, and the sections will move in line until at the required interval.

6. Movements when deployed in line of section columns may be carried out as in company drill.

INSPECTION MOVEMENTS

1. *Forming a Single Rank facing a Flank*

LEFT—TURN

FORM SINGLE RANK, REMAINDER, LEFT—TURN, QUICK—MARCH

The original left flank section will stand fast, while the remaining sections will turn to the left, and be led into line, in succession from No. 1.

2. *Forming Two Ranks facing a Flank*

LEFT—TURN

FORM DOUBLE RANK, NOS. 2 & 4 SECTIONS, LEFT—TURN, QUICK—MARCH

The sections named will be led up into line on the left of Nos. 1 and 3 respectively.

Note.—Column will be resumed on the order RIGHT—TURN, RE-FORM COLUMN, REMAINDER, QUICK—MARCH.

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Another Alternative.—An alternative suggestion, for which I am indebted to Major-General John Duncan, is that instead of single file, a less radical and even more suitable step would be to establish file as the basic formation for the section. This would mean that in the platoon column the two front sections would be abreast, and the two rear also. Thus the platoon would automatically be in close square, like the higher units, and the sections could shake out instantaneously into a dispersed formation at wider intervals and distances with the maximum degree of ease and rapidity.

Among other advantages of file as the standard section formation are that it fits in with the present section organisation and does away with the constant need to number off two sections together for the purpose of forming fours—a source of delay and confusion when shaking out; the section leader is always at the head of his section, and can give instructions to them easily; and the man has a "pal" alongside of him on the march. For inspection, the sections are turned to the left and form single rank, the platoon then being, as at present, in line in two ranks.

Ceremonial

There may be critics who would abolish ceremonial drill, as being an obsolete survival of the days when armies were as much the instrument of Royal pageantry as they were the instrument of policy, and therefore out of place in these days

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of grim and unpicturesque struggle for survival between nations in arms. Such critics might argue that ceremonial has no practical value of application to modern war, and hence should be ruthlessly scrapped along with everything else which is not strictly utilitarian in object. I do not share this opinion, and would contend that while ceremonial may have no direct value, it has a great if indirect moral value because it is the means of instilling pride of regiment and of army in the soldier—and in the civilian spectator—which begets the spirit of loyalty and of power. These are two of the chief elements in that amalgam of moral, physical, and material values, forged in the crucible of war preparation, which yield victory when the test comes in the day of battle.

While maintaining the importance of ceremonial, however, I would suggest that the drill should be modernised in a similar manner to close-order drill. The present system of ceremonial drill suffers, like the ordinary close-order drill, from the defect that it imbues the troops with obsolete methods of movement, which waste a proportion of the all-too-short time available for war training. They even sow the seeds of actual danger by developing sundry habits which may emerge on the battlefield and cause a bloody harvest to be reaped.

A century or two ago the present pattern of ceremonial drill had a direct value of application to battle conditions. Are we to confess that we have fallen behind our predecessors in wisdom,

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that we are less mindful of the law of economy of force? It is suggested that we should seek to remodel this drill so that, without sacrificing its spectacular effect, we might bring it more into line with battle-drill movements. The Guards, the perfect ceremonial troops, are a law unto themselves. But complex movements that are suitable for the Guards are patently too strong a medicine for the citizen forces.

In accordance with this idea I would put forward suggestions as follows:

Review of a Battalion

1. *Formation for Inspection*

The battalion should be marched on to the parade-ground, either in battalion column or in square of companies. It should move parallel to the front to be faced, and when in position the battalion will be halted and turned to face the front similarly as for ordinary inspection. When the inspection is completed, it should be turned to the right again, form square of companies, if not already in that formation, and advance, wheeling into position for the march past.

2. *March Past*

For this, two alternative methods are suggested:

(*a*) If it is desired to retain the present method, the companies need only be turned to face the left as for inspection, and after dressing march past by companies in line.

(*b*) On the other hand, it is suggested that

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the battalion might march past in square of platoons. Such a formation would afford a frontage as wide as the existing model, and would to modern eyes give an equal if not greater degree of impressiveness, because it would convey the atmosphere of readiness for battle and of concentrated fighting power.

3. *The Advance in Review Order*

It is suggested that this, again, should be made with the battalion formed in square of platoons, so giving a more impressive display of battle power.

Review of a Brigade or Division

In these cases it is suggested that the formation, both for inspection and for the advance in review order, should be with battalions in square of platoons facing the saluting base. The battalions might either be drawn up on the same alignment or on successive and parallel alignments.

The march past might be carried out as in (2, *a*), or in brigade column of battalions in square of platoons.

. . . . . .

Mobility is now the watchword of the Army, and any contribution towards it is worth making, especially when it costs no money. Some readers may think that undue emphasis has been laid on a comparatively trivial subject, that while some simplification and reform of our drill may be useful, the forms that drill take are not a ques-

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tion of great import, compared with the greater subjects of mechanisation, and of intercommunication and co-operation between the various arms and the larger formations. They may argue that so far as infantry can play any part in modern battle, it is by *un manœuvre de feu* rather than by any manœuvre of the infantryman. If this be the entire truth, it is strange that the French, who are the main exponents of the idea of *un manœuvre de feu*, and whose doctrine places least faith in infantry manœuvre, have yet gone furthest of all in simplifying and modernising their drill in order to improve the flexibility of the infantry units. While we press on with the work of mechanising the Army on a new pattern, there is also a value in overhauling the older parts of our military machine. Any machine runs better if greased—and a simple and flexible system of drill is the necessary grease for the human cogs of an army.

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CHAPTER X

THE TRAINING AND PURPOSE OF THE TERRITORIAL ARMY

"THE sower goes forth to sow"—in these days when the arresting and suggestive appeal to the eye is so widely exploited it might not be unprofitable to emblazon such a motto in Territorial drill-halls and orderly-rooms as both a reminder and a slogan. That there are many for whom it would be superfluous is shown by the astonishingly high tactical level of some Territorial units I have seen in camp during the past few years. That there are some to whom it might be a useful reminder is proved by the wide variation in the training standard of different units.

What is the connection between these experiences of the summer camps and our present reflections? That in the first class of unit one invariably found that the winter training had been scientifically organised, concentrated mainly on the instruction of the junior leaders by means of a variety of simple schemes worked out on the sand-table and of week-end exercises without troops, so that when the annual camp arrived no time had to be spent on "training the leaders to train their men." The winter is the seed-time of the Territorial Army, and on the use made

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of this period depends the harvest reaped in camp.

It would not be far from the truth to say, "Study a unit's winter-training programme, and you will know how that unit will shape in camp the following year." And in looking at such a programme the cardinal test is the arrangements made for the instruction of the officers and N.C.O.s. The famous saying, "There are no bad soldiers, only bad officers," can well bear adaptation to the subject of training, for the rank and file in peace as in war are mainly what their leaders make them. Instruction is a matter of quality, not quantity—men will absorb far more from an hour's instruction based on a clear framework of ideas than from many hours of haphazard or routine ladling out of text-book precept. In the Territorial Army, moreover, quantity is impossible, even as a make-weight. The time is fixed, and narrowly limited. Hence it is essential that officers and N.C.O.s should not attempt to instruct the men until they have, first, been instructed themselves; second, learnt how to pass on this knowledge in a simple and lucid manner; and third, had time to plan out a scheme of instruction—the principle of economy of force applies just as much to the training of a platoon as to the command of an army in war.

Experience of many Territorial camps has shown that one of the worst handicaps to a unit's profit from their annual training is when the first week has to be wasted—the word is not

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too strong—in a hurried and therefore inefficient attempt to improve the junior leader's own knowledge and capacity for teaching.

The winter is the time—the only possible time—for this training of the leaders, and the more thorough the schemes of their instruction the richer will be the harvest at camp. The corollary to this is that the more officers and non-commissioned officers can be relieved of "drills" during the winter, the better can their own training be carried out.

The solution would seem to be to hold no "drills" for the men until the spring, and instead concentrate exclusively on the officers and non-commissioned officers. In recent years several commanders have experimented in this direction, and the benefit was so apparent that their example has been increasingly copied. It is worthy of note that this was the plan adopted in the East Midland Brigade, which had the honour of taking part in the last Army Manœuvres, winning golden opinions. There, week-end tactical exercises and drill-hall weapon-training courses are started directly the battalions return from camp, and the training of the men is not attempted until the following Easter, though their interest and *esprit de corps* are maintained by making the drill-halls a centre of regimental life, in nightly use as clubs and for informal competitions on the miniature range.

Apart from the immediate practical value of this scheme, the underlying national purpose of the Territorial Army would seem to confirm

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its advantages. For if it is considered as the basis of expansion in case of another war, the development of a cadre of trained instructors is the paramount need, and the training of the men definitely secondary.

Turning now to the means by which this training of the leaders is to be carried out, the first need is to make our minds clear as to what we want to teach. Here we have first to realise, and then to reconcile, two somewhat contrasting aspects. The training of the Territorial Army, as a whole, in peace time should be aimed to develop a force that comprises the elements essential for an effective military tool. These actually are few—the ability to handle a weapon and use ground transforms a civilian into an effective individual combatant; a working discipline and the power of rapid and controlled movement in battle formations change a crowd of individual combatants into a tactical instrument. It will still be in the rough, but a month or two of war training will suffice to polish it up, whereas no military "trimmings" or wide theoretical knowledge will compensate for the lack of these foundations.

But the production of a cadre for expansion means that Territorial officers and N.C.O.s must be equipped both to form a body of instructors and to take a higher grade if a national emergency arises. For such purposes a wider outline of military knowledge is necessary, and the quality of the technical execution is less important. When mobilisation comes, practice will

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soon improve the latter, but the fundamentals of knowledge take longer to grasp, and, because they need reflection, require to be absorbed in less hurried days. Of no subject is this more true than of tactics, for when war breaks out the expert Regular guides are inevitably taken away, and, as World War experience showed, citizen troops with intensive training soon rival their Regular comrades in weapon skill, whereas tactical understanding is a slower growth, for which the soil has to be ploughed by study and the seeds watered by reflection. And tactical proficiency is the coping-stone of an army. The World War brought home the truth of Napoleon's maxim: "With a raw army it is possible to carry a formidable position but not to carry out a plan or design."

Thus for the Territorial Army *as a force* the primary need is to acquire the elements of combatant action, and *as a cadre for expansion* to acquire the elements of theory, relying in each case on practice after mobilisation for the polish. To grasp the reasons for these contrasting requirements is to simplify the problem of reconciling them. In the winter the aim should be, first, to train the leaders to teach their men the elements of weapon-training and fire tactics in the soundest and most lucid way; second, to widen their own knowledge by study and courses, inside or outside the unit. For the N.C.O.s and junior officers the first aim should bulk largest; for the senior officers the second. At the annual camp, on the other hand, the aim should be

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essentially the collective training of the unit in the elements which make it a fighting instrument. All else should be sacrificed to concentration on these essentials. There is but one qualification—Regular officers should remember that the Territorials are citizen soldiers, voluntarily sacrificing their scanty holiday, and therefore to maintain their enthusiasm the training must be made interesting. No one has been a stronger advocate of Wolseley's maxim of "concentration on essentials" than the writer; no one had perhaps a wider view of the improvement resulting from this policy—but it can be overdone. Every pill is better for a little jam, and an undiluted dose of platoon training for the infantry, or driving and gun drill for the artillery, may blunt the keenest enthusiasm. The happy mean would seem to be that adopted in a number of brigades, where the grounding in essentials is carried out for twelve of the fourteen days, and one day in each week definitely set aside for a brigade tactical exercise. Doubtless this will savour of the old-fashioned sham fight, and produce a glorious crop of blunders and unrealities, but all ranks will thoroughly enjoy it, and the seniors may gain some practical benefit. The two days' "jam" will not only help down the "elementary" pills, but keep up the interest without which instruction will fail of its effect.

The means of fulfilling the winter aim fall into two categories. The development of the leaders' military knowledge, the preponderant

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factor for the more senior officers, is gained through week-end tactical exercises without troops and by attendance at courses, assisted by their own study. The week-end exercises have become so general and so helpful a feature of many divisional and brigade programmes that no comment is necessary beyond an emphasis on the value of securing artillery, tank, or air experts to paint a combined picture and so enlarge the horizon of the officers attending, who are normally engrossed with the technique of their own arm. It is helpful both to *esprit de division* and to co-operation in war if Territorial infantry and artillery officers have joint exercises, so promoting that personal acquaintance and understanding which is the oil in the war machine. On the question of courses, one or two points arise which deserve consideration by authority. The Regular has all his time to devote to military training, the Territorial has to sacrifice either his business or part of his annual allowance of holiday. Therefore the dates and period of courses must be arranged to suit the convenience of the citizen soldier, rather than to fit in with the annual training programme or habits of the Regular. Secondly, courses should be as short as possible. Regular Army schools and depots might co-operate in the direction of running more intensive week-end courses, and in all courses for Territorials the week-end should be fully utilised, instead of regarding Saturday and Sunday as days of rest. The instructors' necessary break can be

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arranged when the course is over. The Territorial officer's difficulty is to find the days, and for this reason he would prefer as a rule to crowd more work into the day and so reduce the length of the course. Thus the custom of stopping work at midday, except for an occasional evening lecture, and devoting the afternoon to games, however beneficial for the Regular, is one that might well be abandoned for courses attended by Territorials.

Finally, in the instruction given at these courses, especially those for the more senior officers, it would be well to bear in mind the object which has been brought out above. These courses are primarily an opportunity to widen their military knowledge with a view to the future. Both for this reason and to encourage Territorial officers to attend by infusing interest in the course, more instruction and discussion might be devoted to tactics and less to the recapitulation of elementary details, which can be read up in the manuals or practised in the drill-halls. To start from the beginning is a sound plan of instruction when there is ample time, but where time is limited this repetition is apt to crowd out the more vital requirement of fresh and wider knowledge.

This object of winter training can be helped by other means besides courses and week-end exercises. Lecturing tours may be carried out by the divisional staff—in one North-Country division the training gained immensely from such a round of lecturing, to every battalion,

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made by the General Staff Officer. Again, outside experts can be secured to give lectures on their own particular arm or subject. A final suggestion is that the War Office should issue periodically a lucidly written bulletin, setting forth the latest developments in tactics and armament both at home and abroad, and the trend of opinion on questions still in the melting-pot of discussion. These would go out to all officers, instead of, like existing circulars, mainly to the higher commanders, and would encourage thought and tactical judgment. They would supplement the manuals, which are not only vague and rather general because of their authoritative nature, but in the present transition era become out of date in certain parts almost before they leave the printer, so lengthy a task is their production.

For the second object of winter training—that of teaching the junior leaders to train their men—the means comprise evening classes in the drill-halls, courses inside the unit—usually conducted by the permanent staff—courses at the regimental depot and other Regular Army centres, and week-end tactical exercises, which usually are intended rather for the company and battery commanders than for the subaltern or N.C.O. The range of subjects to cover is not large; for the junior leaders it should be limited practically to what they require to pass on to their men, for such simplicity is the secret of successful teaching on the part of men whose own military experience and knowledge are limited and whose

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instructional powers are usually uncultivated. The scope is clearly indicated in the words of the new Territorial Army Regulations: "In the limited time available for training of the Territorial Army in peace it is not to be expected that, as a whole, it can be trained up to the standard of the Regular troops. The training should therefore be directed towards laying the foundation on which more extended training can be based, and should be confined wholly to such elements as are essential to success in war."

These elements may be defined as a knowledge of the soldier's weapons; the ability to employ them effectively under battle conditions—which embraces the use of ground to gain cover from the enemy's fire; the cultivation of working discipline, the practice of movement in and deployment from battle formations, and the knowledge of elementary fire tactics, three qualities which conjointly enable the fighting groups to combine in carrying out a plan. The training in these elements can be grouped under three headings—weapon training, in which the physical aspect is foremost; tactical training, in which the mental aspect predominates; discipline, which is essentially moral. This classification has a further value if it draws the attention of commanders to the ways of fostering discipline during the winter training. It is too often confounded even in these days with its physical form, smartness of drill and appearance, and thus put on the shelf until the annual camp. The physical was paramount in Frederician

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discipline, but the development of the rifle and machine gun dethroned it. Modern discipline is a product of the mind and the spirit, and the change has enhanced, not lessened its importance. We constantly quote Napoleon's dictum that the moral is to the physical as three to one, yet we sadly neglect to put this maxim into practice, either in our tactics or in our training, in our plans for defeating an enemy or in our measures to fortify our own men against the demoralising effects of enemy action and the "friction" of battle conditions. The spirit of discipline, as distinct from its outward and visible guises, is the result of association with martial traditions and their living embodiment in an historic regiment more than of external influences like drill. Living in an atmosphere of soldierly duty and *esprit de corps* permeates the soul, where drill merely attunes the muscles. It is far from my intention to underrate the value of drill, for drill is essential in every organised process, in the industrial world as much as the military. It is, in fact, but the method of carrying out a movement repeatedly so that it may develop into a habit, and executive skill of any kind is primarily the fruit of habit.

Hence while drill lies at the base of smooth and rapid execution, it is only a subsidiary means to discipline. For these reasons one of the best means to this "atmosphere" of discipline lies in the close association of Territorial battalions with the depot of the regiment to which they belong. The last few years have witnessed

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a deeper recognition on the part of Regulars of the tribute and the service they owe to their Territorial comrades in arms, and the more this link is strengthened by short courses at and visits to the regimental depot the more will the *esprit de corps*, and hence the true discipline, of the Territorials be enhanced. It is worth emphasis that the Territorials have already the foundations of this discipline prepared, for the very fact that they have devoted their leisure to this national duty is testimony that they possess the spirit of self-sacrifice and service which lies at the base of a working discipline, and when martial traditions are added as a roof the structure is ready to weather the storms of future battle.

Turning next to the subject of weapon training, this is now so well organised and taught as to require little comment. Apart from outside courses, the best channel of instruction is to run definite courses in the drill-halls rather than a more general series of evening classes, at which the attendance is inevitably intermittent, and the instructional value correspondingly handicapped.

The sphere of elementary tactical training deserves fuller study. For the junior leaders the winter, despite its outward disadvantages, is in reality ideal for this purpose. The cause lies in the development of sand-table instruction during these last few years; a teacher with imagination can arrange a far wider variety of situations and lessons, and give a greater atten-

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tion to individuals, than he could in the same time out on the ground. To officers acquainted with the history of the citizen forces there is no need to stress the debt which tactical progress owes to the old Volunteers, who by the introduction of the war-game on the map and their tactical societies brought about the renaissance of tactical study in the British Army. But the war-game demanded students with imagination and was unsuitable to the teaching of minor tactics, whereas the sand-table aids both. For the junior officer and N.C.O. the problems which face sections and platoons in battle are more useful and more important than the handling of forces of all arms.

But while sand-tables are now in general use, there is a marked difference between the use of them by different units, and thus some practical hints may be of service. But before giving these I would like to stress another instructional medium—like the sand-table an exploitation of the now recognised truth that education by the eye has a greater force and vividness for the average man than the old method of education through the ear. Take out a group of such men and launch them straight into a tactical exercise, or even the simplest form of platoon-drill attack, and because their imagination has not been appealed to they will carry it out as if taking part in a ritual. They will act in a certain way because they have been told to or because they see others acting in that manner. They may develop into efficient parrots, but not into efficient

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soldiers. Even the excellent method of instruction by demonstration platoons at camp loses half its value because it shows men a model to copy but not a stimulus to think. The remedy is to teach elementary tactics in the metaphor of personal combat, boxing if you like, which all understand. Go further, take men out of the squad and illustrate your explanation of tactical principles by a simple demonstration. For example, to teach men why a force moves with an advanced guard ahead, or a platoon sends out scouts, blindfold two men and tell each to search for the other while guarding himself against surprise. The men will instinctively stretch out an arm to feel for the opponent and ward off danger. Then drive home the lesson that just as each man, in the dark as to his opponent's whereabouts, instinctively stretched out an arm, so in war does every force or unit.

Each of the principal tactical acts may be demonstrated similarly, and thus when the men come to practise tactics their understanding of the reasons for their action will be quickened and their initiative developed. If the junior leaders are taught the use of such elementary demonstrations in the winter evenings at the drill-halls, they will be equipped to pass them on when they come to train their sections and platoons later.

Finally, as regards sand-tables. If not already provided, these are simple to construct—a wooden tray 5 feet or 6 feet long by 3 feet to

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4 feet wide, and with sides some 4 inches deep. Have the floor of the tray painted blue, which saves trouble in simulating rivers or streams and adds to the reality. Use sufficient sand to cover the floor to a depth of about 2 inches, and from any chemist buy a loofah or two, which, when dyed green and cut up into strips, make ideal hedgerows. With a few shillings spent on toy houses, some cotton-wool, a bunch of heather, and thirty halma men—more realistic than flagged pins—your materials are complete. Then construct your model of a stretch of country, roughly to scale but not exact, for in order to appeal to the imagination contours and features must be exaggerated. Do not be too elaborate, or pride in your workmanship will cause reluctance to change the scene, and so limit the lessons. Heap up the sand to make hills or undulations, draw your finger along the tray bottom to create a stream, use a little yellow chalk to mark a road, bits of heather to indicate woods, the wooden model houses to form a village. Finally, damp the sand slightly and pat it down firmly. Then for your lesson use halma men of assorted colours, one for the rifle and another for the Lewis-gun sections, the section commanders of a third colour. Graduate the lessons; first of all teach the simple section formations. Then, by putting down balls of cotton-wool to show where shells are bursting, teach the class to adapt the formations both to the ground and the enemy's fire. Pick out four members to represent the four section

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commanders of a platoon, and after "painting the picture"—"Smith, your section comes under shell fire as it reaches that crest"—you ask "Smith" what command he will give, and then make him place his halma men in the appropriate formation.

So you carry on, point by point, weaving the points into the scheme and bringing out all the different formations, the reasons for them, and the conditions under which to adopt them. The whole range of platoon tactics can be taught on such a sand-table, and many company and battalion situations as well. But it is a mistake to make the scale too small or to teach too many lessons at one time. Further, it is better, usually, to create rather than to simulate a piece of country, for the latter course involves longer time, and so a reluctance to vary; further model made to scale loses much of its appeal to the eye of the average man.

This survey of the training problem may help to correct the popular and even in some measure the military impression that the summer camp is the main period of the year's training. More vital in importance is the winter period, the time when the soil is ploughed and the seeds sown upon which depends the quality of the harvest reaped in camp. One may go further and say that upon the work of this period depends the harvest reaped in the future, perhaps near, perhaps far, when the security of these isles and this empire shall be again menaced by

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a foreign foe, and when the national call to arms will be the day of judgment for the Territorial Army—whether it has fulfilled its purpose, as an effective basis for expansion, by the development of a cadre of trained instructors for the new levies.

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CHAPTER XI

THE LEADERSHIP OF ARMIES

"READ and re-read the campaigns of Alexander, Hannibal, Cæsar, Gustavus Adolphus, Turenne, Eugène and Frederick; take them for your model: that is the only way of becoming a great captain, to obtain the secret of the art of war." There is no dictum of Napoleon more widely quoted than the foregoing, nor any perhaps less understood. For half a century before 1914 the General Staffs and war schools of the European armies had devoted themselves to an intensive, if not extensive, study of military history which was a testimony alike to their enthusiasm and their industry. Countless French soldiers studied the minutest details of Napoleon's campaigns and of 1870—neglecting all other wars —in order to discover by the comparison the secret of Napoleon's art. They usually "found" it in some geometric formula of manœuvre or in some mystic formula of the will to conquer. And the outcome in 1914 of all this study was a plan of fantastic unreality and a doctrine of the *offensif à l'outrance* which led them to hit their heads against a solid wall when they were not hitting the air.

The Germans were enthralled partly with the idea of a greater Sedan developed from the

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miniature model of Cannæ and partly with their 1866 and 1870 recipe of "marching to the sound of the guns." The only practical result in 1914 was that the Supreme Command not only missed taking possession of all the important political objectives, which, like ripe plums, were ready to fall into their hands, but, obsessed with the preconceptions of Sedan and Cannæ, tried to pluck the military fruit before it was ripe. The subordinate Army Commanders took their own course with the same bland disregard as in 1870 for the higher command or their neighbours. And, as the crowning touch to their series of blunders, they were so imbued with the rules of the military game that they made a general retreat for which there was no necessity if they had appreciated the power of modern arms as well as they appreciated the conventions of orthodox strategy.

If the British Army, by its variety of experience, escaped the full grip of this "dead hand of the past," its historical studies tended to be parochial rather than universal. The horizon was bounded by the nineteenth century and the foreground was filled by the American Civil War, admirable as a lesson but less satisfying as a complete education. And the method of study was one of excessive concentration on detail rather than an inquiry into the broad principles of the leader's art and comparison with that of the great captains of all ages. To be able to enumerate the blades of grass in the Shenandoah Valley and the yards marched by Stonewall Jackson's men is not an adequate foundation

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for leadership in a future war where conditions and armament have radically changed.

The most striking and most curious reflection on the education of the military leaders of 1914–18 is that despite, or perhaps because of, their emphasis on material details in their study of past wars, they failed to grasp the significance of the changes in material which brought the trench stalemate, and that later, in their awakening to the importance of material factors, they so long forgot the cardinal lesson of universal military history—that surprise is the master-key of war.

If the study of military history thus dug so many pitfalls for the leaders of the World War, are we to conclude that this study is worthless, nay, even harmful, and that it is better to fall back on the guidance of unfettered common sense or practical experience?

There are many civilian critics who will argue that common sense alone is necessary and that the common sense of the professional leaders of 1914–18 was cramped by convention—a statement in which there is truth, but not the whole truth. They point to the success of the Dominion forces, whose operations were often more economical of life and distinguished by a fertile use of surprise, and claim that if in the forces of the mother-country the "amateur" had been given an equal chance to command, victory would have been more rapid and less costly. They complain that in our own Army all the higher posts were regarded as the preserve of the professional soldier and the gate to advancement

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firmly bolted and barred against the quondam civilian, whereas the Dominion forces, where this rule did not apply, produced Monash, Currie, and scores of other capable "amateur" generals.

With similar result, but with opposite motive, there are many professional soldiers who will decry the study of military history and argue that practical and professional experience is the only safe channel to command. They dismiss the blunders of the French and German leaders as due to excessive theory and too little experience of fighting, for want of sufficient colonial wars. They excuse the failures of our own professional leadership by asserting—without inquiring into its cause—that trench warfare was a regrettable but unavoidable lapse from proper warfare, or by the unhistorical dictum—what reck they of history?—that "a great army cannot be outmanœuvred, it can only be worn down by hard fighting." These are the same "practical" soldiers who are now training their troops for mobile warfare without any practical efforts to provide different weapons and equipment than those which inevitably led to trench warfare in 1914.

Where lies the truth between these two schools of thought, or rather of rhetoric? Not surely in the neglect of military study and history, for history is the concentrated essence of universal experience, and its practical value could not be better expressed than by applying Bismarck's saying, "Fools say that they learn from their experience. I have always contrived to get my

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experience at the expense of others." This saying is a shrewd thrust at the " practical experience " school.

But the value of military history depends on the quality of the student and on the attitude in which he approaches the subject. If his mind is cramped by routine, age, or a narrow general education, he will merely glean facts and not reap wisdom. It is only of antiquarian interest to be able to recite the minute details of Wellington's or Stonewall Jackson's campaigns, without penetrating to the basic principles which inspired their plans and actions. Weapons, equipment, conditions, have all changed, but the mind of the leader remains. It is of little benefit even to work out the march-tables, detailed dispositions, and the administrative arrangements of some bygone army as a training for the command of modern armies. The aim of military study should be to maintain a close watch upon the latest technical, scientific, and political developments, fortified by a sure grasp of the eternal principles upon which the great captains have based their contemporary methods, and inspired by a desire to be ahead of any rival army in securing options on the future. The ways in which Napoleon achieved strategic surprise are of little guidance nowadays, but his ruling idea of strategic surprise ought to dominate the mind of any commander. The practical value of history is to throw the film of the past through the material projector of the present on to the screen of the future. On this screen, in letters of

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fire, stands out the word SURPRISE, unchanging through the ever-changing scenes. Only from 1866 onwards did the letters become dim, and dimmest of all throughout the greater part of the drama of 1914–18. This half-century also witnessed a marked development of the professional framework of armies—organisation, training, and promotion now so carefully regulated that an army career became a strictly defined profession. The coincidence is so striking as to deserve examination. No military historian will question the claim that armies are now incomparably better organised, better equipped, better trained, than at any other period in modern times. The staff work is infinitely superior. Only the command seems to have become enfeebled, its essential vitality sapped. Are we to deduce the axiom that the better the staff, the worse the generalship? Or is there a deeper cause? Surprise is the supreme virtue of warfare, originality of mind the quality which breeds it. Is there some link between a decline in this virtue and the professionalising of armies?

If by a survey of the varied aspects of this problem I seek to probe for its roots, let it also be clear that the attempt is in no sense an attack on the professional soldier, who is not only inevitable but essential; it is a dispassionate inquiry into possible reasons why boldness of manœuvre, fertility of ruse, and the exploitation of novel means and methods have declined—as every war since 1866 reveals—since armies have become highly professionalised.

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First let us take the much-disputed question of the "amateur" *v.* the "professional," a question as much distorted by those publicists who in the World War suggested that a lifetime of business and a year or two of trench warfare were a qualification for the command of armies, as by the conservative soldier who asserted that only those regularly apprenticed to the profession could judge or give an opinion upon military questions. Much confusion of thought has bemused the issue—distinguished soldiers have, for example, derided Mr. Churchill as an "amateur," forgetting that he had spent more years in soldiering, seen more active service, and probably read as profoundly, as Napoleon at the outset of his 1796 campaign—the most classic example of his art. Ten years later Mr. Churchill's war-time memoranda have been raised up in judgment upon these "professional" critics and their rash gibes.

Most professional soldiers who have studied and reflected deeply on their profession realise that a knowledge of the art and science of war is not necessarily conferred by years of routine soldiering, that the book of military knowledge is open to all, and that those few who have mastered its contents by intensive study may include representatives both of the professional and also of the amateur soldier.

Appreciating these truths, they neither expect wisdom as a matter of course from an officer who has been through the "regular" mill, nor do they refuse to recognise its existence under the temporarily

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donned uniform head-dress of the "amateur" officer. The exceptional professional soldier who has achieved a mastery of his profession knows that there is no royal road to competence, that it can only be attained by hard study, and, above all, by constant reflection and meditation on the data drawn from that study. He realises that the advantage he may have from personal acquaintance with the difficulties and "friction" of military operations and movements and with the psychology of time-serving soldiers of his particular army is counterbalanced by the more independent mind of the civilian student of war, unfettered by years of military routine and the influence of a lifetime spent in the circumscribed sphere of army and, especially, of regimental life.

That the professional soldier has passed through this groove is not his fault, but it may be his misfortune. Rare is the gifted individual who can pass through the successive grooves of a public school, Sandhurst, and a regiment, with never a break, and remain completely untainted by the traditional prejudices of his class and his calling. Magnificent influences though these are for producing a type whose sterling character and habit of self-discipline are recognised throughout the world, it is hardly disputable that this self-discipline can only be attained at some cost of individuality, and tends towards a sealed-pattern type. Moreover, a separate and self-contained community, be it a monastery, a public school, or a regiment,

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is not perhaps the ideal training-ground in which to acquire a knowledge of the psychology of the many varying types of men.

Miraculously blessed is he whose mental horizon, when he has reached a position of command, remains unclouded by the traditions, social and professional, he has imbibed; whose experience has not been bought at the price of some measure of his imagination, mental independence, and receptiveness to new ideas. Every generation prepares for a war unlike in certain respects to the previous one. To be prepared and mentally equipped to grapple with these new conditions and to foresee them is necessarily more difficult for those whose whole time and occupation are perforce a perpetual contact with an organisation and with methods springing from the previous war. How difficult, history, with its long record of disasters due to commanders who were thinking in terms of past wars, clearly tells us.

Let it not be thought that these mental grooves are peculiar to the soldier. They are true of every profession—of none probably more than that of the much-lauded "business man," whose clamoured-for intervention in the realms of government proved in practice by no means an unqualified success. No doctor, again, with the memory of the treatment meted out by his profession to many unqualified but successful healers derided as quacks, can afford to throw a stone at the professional soldier's lack of foresight and imperviousness to new ideas. But

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the man who makes a study of another profession than his own, if only as a hobby, naturally preserves a wider outlook and a less constricted habit of thought than one whose pursuits are confined to a single direction.

It is this priceless gift of independence and freedom from habit-induced prejudices which the "amateur" student of war brings to bear upon the study of war. This, the larger-minded and really proficient regular soldier appreciates, and hence values the co-operation of his non-professional colleagues. It is the professional hack, incapable alike of personal research or critical judgment, who disparages without examination the views of the outside student. It is wonderful what a contempt the village police-sergeants of this world have for the Sherlock Holmeses!

The widespread prejudice of such professional soldiers against even examining the suggestions of an amateur, let alone admitting their value or accepting them, is not of course a characteristic peculiar to the present generation of soldiers or to our own country. It is long-standing, and the pages of military history, written and unwritten, bear constant witness to its antiquity.

The scarcely veiled contempt which the "practical" professional had for the amateur was allied with that he held for the despised "theoretical" regular soldier. He laid down in tones generally more emphatic than polite that work in the study was immeasurably inferior, if not valueless, as a preparation for war compared with experience in the field.

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It may be pointed out that this type, fortunately declining, of professional soldier is apt to confound "experience" with the years he has spent in drawing full pay, and the "field" of war with the routine duties of barracks or the artificial conditions of the training-ground.

Since the World War placed many amateur students of war on an equality with the professional in respect of actual personal experience of war, the narrow-minded type of regular soldier—so far as he still exists—has been driven to fall back upon this last line of defence of his claims to superior authority on war. But he conveniently forgets that not 10 per cent. of his working hours during an average year in time of peace is spent in field training.

When we bring such claims to the bar of reason, the fallacy may be realised of associating competence in barrack duties, on the square, in the office, or in the barrack-room, with a mastery of strategy or tactics. The Manual of Military Law, the Equipment Ledger, even the Drill Book, are poor guides on the field of war.

Even field training is at best but a means of practising the execution of movements and the habit of making decisions—under conditions inevitably artificial. For junior officers it may also serve as a peptonised tactical food until they are capable of digesting the pure food of military science. This can only be gained by study and reflection on the lessons of military history and their application, in the light of new weapons and conditions, to future war.

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If the mechanical tasks of the "practical" regimental soldier in peace time can only help him slightly on his way to an understanding of strategy and tactics, how much less likely are they to stimulate within him the vision which foresees future conditions and creates new ideas and methods to meet them. Mechanical perfection in any task, civil or military, must always be the foe of individuality and originality of thought.

All the more honour to those gifted professional soldiers who have shown creative brains, but also all the more reason why we should preserve an open and receptive mind to the far larger stream of ideas which have come from "amateurs," from Roger Bacon and Leonardo da Vinci down to the Volunteers who simplified our cumbrous drill and developed our musketry and tactical instruction.

Nor can we forget that the decisive new *weapon* of the World War, the tank, owed its introduction principally to "amateurs" in the face of stubborn opposition from the supreme professional opinion. It may also be significant that the one soldier who contributed notably to its causation was an engineer and a writer of fiction.

Let us turn now to the final contention of the "practical" soldier, that actual experience in the field is superior to study as a means to a mastery of war. The inevitable corollary of this claim is that the man who has seen most fighting must be the greatest authority on tactics.

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In this connection one may recall the story of Marshal Saxe and the aged general who urged the acceptance of his opinion on the ground that he had seen more campaigns than anyone else, whereupon Marshal Saxe replied that he had a mule which had been through twenty campaigns " and was still a mule."

The experience of any individual, however wide, is restricted to certain phases and localities, and can at most only comprise an infinitesimal percentage of the episodes and conditions of a war. Far less can it be compared with universal experience as contained in military history. How strained appears the claim that prolonged experience of war is sufficient to make one an authority on it!

But if we are driven to accept Napoleon's " read and re-read " as the only key to knowledge and command, the admission involves the recognition of certain facts which qualify the professional soldier's claim to special authority on strategy, and perhaps also on tactics. The library of war is open to all, and while the professional soldier brings to it an acquaintance with the " friction " of military movements and the actual conditions of the battle zone, this advantage is counterbalanced by the amateur's possession of a mind the freshness and versatility of which have escaped the restrictive influence of professional life. When, further, the amateur has also seen something of war—and the duration of his experience need only be in inverse ratio to his capacity for reflection—he may have an actual

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advantage over his professional brother, given equal study and intellect.

The conclusion, therefore, is surely unanswerable, that where each has some acquaintance with actual war and has devoted to it an equal degree of study, that man will have attained the greater mastery of strategy and tactics who has the greater capacity for reflection, analysis, and originality of thought, whether he be an amateur or a professional soldier.

Counsel for the professional student of war may here intervene to point out the advantage the latter enjoys in regard to study by attendance at a Staff College. Certainly such a training is an aid to acquiring the mechanism of staff work, whilst it undoubtedly facilitates co-operation between formations and for the carrying out of the intention of the commander. But again we are brought up against the axiom that perfection in the execution of orders and a common mode of thought are usually gained at some sacrifice of originality and initiative. No system of Staff College training, however far developed, can escape the danger, because of its very nature, that it may become a factory for the mass production of stereotyped brains. The truth of this cannot be better exemplified than in the case of the German Army, the best Staff College-trained corps of officers ever known, where the administrative efficiency of the staff was first wasted and then brought to ruin by the blunders of the Higher Command. Here we have a strong proof of how leaders who have passed through

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the professional mill tend to lose those particular qualities of originality of conception and vision which are the essential qualities of the great captains. In this respect war is no different from the other branches of life and knowledge. The great discoveries of science have all been achieved by the solitary research of some individual, whose mind is able to investigate unfettered by the mental grooves characteristic of all types of corporate institution. Thus while we recognise the great advantages for the smooth working of the machine which a common staff doctrine bestows, it is well to bear in mind the disadvantages and dangers which it necessarily entails.

Having dealt with the case of amateur *v.* professional, and incidentally of the theoretical *v.* the practical soldier, we may now turn to the question of age *v.* youth. Here again our former postulates apply. The advocates of the claims of age and experience cannot pretend that intellect is any more the prerogative of age than of youth. They may, however, urge that age has had greater opportunity for study. But rare is the senior officer who could honestly claim to have devoted his lifetime to intensive study. More often the hours spent in study steadily decline with the gradual extension of responsibilities. Few, indeed, have been able to devote even a year or two during their career to intensive study. In the case of the majority, study has been desultory. Thus where, as so often happens with genius, the intellect ripens early, the young

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student may have spent more hours in reading and reflection by the time he is twenty-five or thirty than most men spend in their whole lifetime.

Even where, as in the case of a Foch, the period of intensive study is sustained until ripe years, youth has still the compensating advantage that it brings greater freshness of mind to bear upon the problems of war.

Thus Napoleon, having completed his period of intensive preparation before the ordinary young officer has even turned his mind to the serious side of his profession, was able not only to take command of an army at twenty-six, but to attain to a height of military capacity which even he himself never surpassed as he acquired the greater "practical" experience so widely acclaimed as the only key to success.

According to these pedants, Napoleon at Waterloo, having had nearly twenty years of practical experience in command, should have exercised a far greater mastery than as a youth at Montenotte. History demonstrates the contrary, showing us that even in the case of that supreme genius his mental elasticity decayed as his practical experience grew.

Clausewitz put the case for independent study *v.* practical routine experience in a nutshell with his comment on this Montenotte campaign. "Bonaparte was twenty-six years old, Beaulieu (his opponent) sixty-two. Bonaparte had a vast historical education: the great events of the history of the world had passed in panorama

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before his eyes. Beaulieu had merely forty years of official pedantry for education."

Let us see if the record of the other Great Captains confirms the conclusions we have drawn.

Alexander the Great was barely twenty-five when he won his last great victory of Arbela; Hannibal only twenty-nine when he invaded Italy, and but thirty-one when he achieved his crowning triumph, Cannæ. After sixteen years of war he succumbed at Zama to the more youthful Scipio of thirty-two, who in face of outraged senior opinion broke with the Roman tradition both in strategy and tactics, and turned Hannibal's master-weapon back upon himself. As Alexander and Hannibal owed their elevation to command to hereditary influence, and disaster had called Scipio to command, at twenty-four, the question of professionalism does not arise. Cæsar only assumed a military career at the age of forty. Yet his lack of practical experience and professional training did not prevent him proving his superiority to Pompey, who had spent his life in the field and had thirty-five years' experience in the command of armies, since the age of twenty-three.

These are the Great Captains of antiquity, and there is no other who can be ranked as such until we come to modern history. Gustavus Adolphus, another commander by virtue of heritage, was still but thirty-seven when he won his great victory of Breitenfeld over Tilly.

Cromwell knew nothing of soldiering till the age of forty-three, when he commanded a troop

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of sixty horse at Edgehill. A lieutenant-general in less than two years, he was commander-in-chief at fifty-one when he won the Battle of Dunbar, followed a year later by " his crowning mercy," Worcester. But the high-water mark of his vision and creative power was reached in his first three years of service, when he trained the " New Model " and stamped himself as one of the supreme cavalry generals of history.

Turenne is, on the whole, the exception which proves the rule. An out-and-out professional soldier, he certainly had genius, becoming a Marshal of France at thirty-two. But, unlike the other great leaders, his genius ripened instead of decaying with the passage of years. The anomaly may have been due to the peculiarly geometric and chess-like methods of waging war in his time, which demanded a deliberate, calculating brain rather than the mental energy infused into war by Napoleon.

The course of Turenne's great contemporary and rival, Condé, forms a contrast. Heritage placed him in command of an army at the age of twenty-two. But, fortunately, to the mental freshness of youth he added years of education in military theory during his boyhood. Faced by the Spanish Army, the most renowned troops in Europe, under leaders so experienced that they had lost their elasticity of mind, Condé proved as brilliant in his first battle as in his last. In the battle of Rocroi this youth of twenty-two ended the long military supremacy of Spain and inaugurated the reign of French

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military glory, displaying a genius more versatile than that of Turenne, a power of quick decision and energy unknown until the eruption of Napoleon into the placid course of chess-like war.

Marlborough, though having some military experience, was in the early part of his career even more a courtier. Given a command in the Monmouth rebellion at the age of thirty-five, it was due to his skill that the rebellion was crushed. In the seventeen years which intervened before the War of the Spanish Succession, politics and diplomacy kept keen the sharp edge of his wits, which were not subjected to the dulling influences of peace-time military routine. Thus at fifty-two he entered the theatre of his great triumphs with the freshness of his military brain undimmed.

Frederick the Great, by right of inheritance, found himself in command at twenty-nine, but as yet a novice as regards military knowledge. His first battle of Mollwitz was creditable neither to his skill nor to his courage. In another four years he had risen, through application, to be the first general of Europe.

Napoleon we have already dealt with.

Wellington, again, owing to family influence, escaped the long years of military apprenticeship and was only thirty-four when he had the opportunity to display his military genius in winning the victories of Assaye and Argaum. Still under forty when he landed in the Peninsula, he achieved his final triumph of Waterloo at the age of forty-six.

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Robert E. Lee can be claimed as an example of the true professional soldier, but even in his case Mexico, engineering work at Washington and Baltimore, and frontier fighting gave relief from the insidious influence of years of routine soldiering.

Stonewall Jackson was only twenty-seven when he abandoned the professional army to take up a professorship at Lexington. Ten years of isolated study and quiet reflection enabled him to return, when the American Civil War broke out, with mind fresh and ungrooved to conceive and execute the dazzlingly original moves of his ever-famous Valley Campaign.

Von Moltke's victories, great though they were in extent, were triumphs of the obvious. Their flaws have been so clearly demonstrated that his place in the list of great captains is far from secure. In them is to be found no trace of the *unexpected*, which has ever been the hallmark of the supremely great.

What do we find when we examine the records of these, probably the fifteen most famous commanders in history?

First, as regards age, that five had demonstrated their mastery of war before they were thirty and six more before they had reached forty years of age. The powers of three of the greatest had definitely decayed long before they were fifty, whilst only two held active command when over the age of sixty.

Secondly, as regards the value of professional experience, only four out of the fifteen had

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served any considerable duration of apprenticeship, whilst only one could truly be said to have suffered the sterilising influence of routine soldiering in time of peace, and even in Lee's case there had been breaks.

Thirdly, touching the question of amateur *v.* professional, we find that no less than nine were really amateurs who took to a military career either as a means to greater power or for the sake of their country. Of these, Cæsar and Cromwell were complete amateurs who had passed forty before they even dabbled in the profession of arms.

Far otherwise is it with the list of notorious blunderers who have served as foils for the genius of the Great Captains or whose defeats have gone down to history because of their disastrous effect on the destiny of the countries whose security they guarded so inadequately. Almost without exception they had grown old in the profession of arms. Dealing with modern history alone, one may recall the names of De Mello and Fuentes at Rocroi, Tallard and his subordinates at Blenheim, Villeroi at Ramillies, Vendôme at Oudenarde, Braun at Prague, Soubise at Rossbach and Wilhelmsthal, Daun at Leuthen, Contades at Minden, Beaulieu, Würmser, and Alvinzi in the Italian campaign of 1796, Mack at Ulm, Weyrother at Austerlitz, Pope at 2nd Manassas, Burnside at Fredericksburg, Benedek at Sadowa, Bazaine at Metz, MacMahon at Sedan, Samsonov at Tannenberg, Moltke, Bülow, and Kluck at the Marne.

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Let us also recall the verdict of Colonel Henderson on the tactical ability of amateurs compared with the best-trained professional army of the period. Referring to the American Civil War, he said: "The tactics of the American troops, at a very early period, were superior to those of the Prussians in 1866." Moreover, practical experience did not give results which altered his opinion, for he added: "Nor were the larger tactical manœuvres of 1870 an improvement on those of the American campaigns."

Finally, one may recall the many instances where amateur leaders with amateur troops—a severe handicap—have successfully defied, outwitted, and defeated the representatives of the great professional armies. Selecting only a few from the lengthy roll of history, one may mention the destruction by Arminius and our remote ancestors of the Roman legions under Varus; next the leaders of the Swiss Confederacy who routed the forces of Imperial Austria; the Netherlanders who defied the veteran troops of Spain, then the greatest military nation in the world; the victories of the American colonists over our own professional army; Garibaldi's overthrow of the Austrian yoke; the many successes of Botha, Smuts, and De Wet against us in South Africa.

Thus, in sum, the verdict of history is decisively against the contention that either age or practical experience of regimental routine is an aid to a mastery of strategy and tactics. Youth

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and independent study come well out of the argument with seniority and "practical experience," which too often have been synonyms for senility and mental atrophy.

No one would be so foolish as to pretend that every young student of war is a Napoleon or every amateur a Cromwell. Yet there are still soldiers who base their claim to speak with authority on the length of their service. They might reflect upon an interesting historical comparison—Masson in "La Grande Armée de 1805" tells us that the average age of the 141 general officers was forty-one years; in the British Army on the eve of the Crimean War there were 50 generals of more than seventy-eight years, 163 between sixty-eight and seventy-eight, and only 7 under fifty-eight years of age. Little wonder that the campaign of 1805 is as much a military classic as the Crimea is a byword for incompetence.

Indeed the lesson of history seems to be that not only are study and reflection the keys to success, but that profitable study can only be made by a mind which has not yet fallen into the grooves of custom and which still possesses an unfettered habit of thought.

The danger to the professional soldier is that he inevitably tends to base his tactical thought on the methods which prevail at the moment, and with which he is in constant contact. He concentrates upon the attainment of mechanical perfection in the executive acts with which he is familiar.

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If original ideas come more easily to a mind untrammelled by contact with precedents and traditional methods, the fact may explain why so few wars have been decided by the introduction of new weapons or tactical methods, and why the exceptions have usually been due to the influence either of civilian inventors, quondam civilian or amateur generals, or else leaders so youthful that their minds have not settled into any grooves of thought.

Long training tends to make a man ever more expert in execution, but that skill is gained at the expense of fertility of ideas, originality of conception, and elasticity of views. There are fortunately exceptions to every rule, and our own Regular Army has thrown up its military Luthers, from Sir John Moore down to those creative minds of to-day which are thinking ahead—not like Lot's wife risking petrification by looking back. How, then, in the future are we to ensure that our methods shall be those of surprise instead of mere attrition? It is suggested that the clue to our national security in the future is by the encouragement and tangible recognition of new ideas and of youth which can produce them. It is useless to pour new wine into old bottles, and hardly more hopeful to expect generals whose minds have become set to make effective use of new weapons or tactics. Youth is surprise and surprise is war.

It may be objected that we have confused "ideas" with "execution"; that the possession of original ideas is different from, or even

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incompatible with, the power of executive command. To this contention we would reply that the gulf between these two faculties is narrower than is commonly supposed. The conception of ideas implies mental initiative, and the moral courage required to express them publicly and with vigour in the face of tradition-bound seniors indicates a strong personality, for the rôle of pioneer or reformer is rarely a popular one. These two qualities of mental initiative and a strong personality, or determination, go a long way towards the power of command in war—they are indeed the hall-mark of the Great Captains.

The theorists who have failed in war have nearly always been of the academic type, whose habit it is to delve pedantically in the past rather than to probe into the future. These soldier pedants reveal their nerveless personality in their very prosiness and custom of hedging every point with innumerable reservations.

The written essay or appreciation is a fine test of character and grasp of the principles of war. It explodes unkindly the legend of the "strong, silent man"—who is usually silent because his mind is so hazy that he fears to commit himself to the risk of logical argument. The man who writes gives proof that at any rate he possesses some knowledge, whereas it is quite a possibility that the mind of the inarticulate one may be a military vacuum. Further, arguments that would pass muster in verbal conference are easily seen to be lacking

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in logic when written, for cold print is a merciless exposer of mental fog.

Even if ideas do not prove wholly true in practice, the ability to conceive and express them is of value, for it is an axiom that even an imperfect plan carried out with determination is better than a lack of plan.

In recent generations, as the corps of officers has become a closer professional body, the higher commands have become ever more firmly clenched in the hands of age. In the World War nearly all the principal French commanders were over sixty, the Germans, unless royal puppets, even older, although it is true that after the first debacle the supreme direction was actually exercised by two comparative youths in the early fifties—Falkenhayn and Ludendorff. The former, however, was at first in danger of being unseated because he was "too young," and the latter had to veil his authority behind the septuagenarian figure of Hindenburg. The British higher commanders, if a shade younger, were mostly in the late fifties. The test of war wrought violent upheavals in the lower strata, throwing up battalion commanders of twenty and brigade commanders of thirty or under, but none succeeded in rising to the grade of divisional commander, far less to the command of corps or armies.

I do not suggest that many were fitted, for resolution, common sense, and some measure of organising power were sufficient qualities for a battalion or brigade commander in France,

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and the handling of a subordinate unit in that vast trench struggle gave little scope for what Marshal Saxe termed "the sublime parts of the art of war." Many of the lay critics based their advocacy of "new" blood in the higher commands on the success of officers of the New Armies in commanding battalions and brigades, and although there was some justice in their contention so long as trench warfare persisted, it was founded on a fallacy. For the majority of such temporary commanders had never studied war until they took commissions in emergency, and then there was no opportunity for study, so that the authorities might justly doubt their powers of adaptation if siege work suddenly gave place to normal warfare. Further, the oft-argued comparison with the Dominion Forces had a weakness, except in the case of Territorial officers, for most of the Dominion commanders had made some study of war as Militia officers. Napoleon's "read and re-read" is still the only sure foundation for command in war, and study and reflection are the almost essential complement to the natural gifts of leadership—will and originality.

Yet if it is true that few of the new officers or younger Regulars were qualified for higher command, it is equally sure that none were chosen. Even Mr. Churchill, who brought to command of a battalion the experience of five campaigns and, according to the testimony of his officers, quickly proved his adaptability to trench warfare and power of command, was given no wider scope.

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But if the rise of youth was more restricted in 1914–18 than in earlier wars, the outlook is far worse to-day. In the pre-war Army, Haig was a major-general at forty-two; to-day the youngest major-general is forty-seven and the average of the colonels is the same. Yet merely on the score of the physical strain and hardships of active service, war experience shows that for command of battalions and brigades thirty-five years of age is the limit for all but exceptional men, and for higher commands in the field Napoleon's remark that his powers would be on the decline after forty-five—as he confirmed at Waterloo when forty-six—is still sound guidance. The shelter of châteaux headquarters in trench warfare may have preserved them in the last war, but if warfare again becomes mobile, to appoint old commanders is to court disaster. By all means let us preserve their wisdom and experience in council, so long as they are young in mind. Many of the youthful Great Captains had veteran advisers as ballast to their impetuous daring, and we might restore the tradition. Indeed, the association of young commanders with old staff officers, heresy though it may seem, is more logical than old commanders with young staff officers, which too often—as in the German Army—leads to youth exercising the power without the responsibility.

Is there any way of rejuvenating the command of armies under a professional system? Our own authorities have shown their concern

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over the growing stagnation and are attempting remedies. But, paradoxically, the very remedies which tend to ameliorate the Army as a profession tend to check the rise of genius as distinct from competence. In selecting officers for nominations to the Staff College the choice is now made from a nameless list giving a précis of the records of the officers qualified. Similarly the new scheme of promotion, wherein selection and seniority are blended, is based on officers' records and reports throughout their service. The qualifications cited as necessary are most estimable—they include every possible virtue except originality.

The flaw in all these conscientious attempts to improve the system of promotion is that they tend inevitably to stress the formal record at the expense of the human element and that they aim at an improved flow of promotion when nothing less than an eruption will avail. In fact, the effort to make the Army fairer as a profession is contrary to the very nature of its object—war, which is essentially unfair. The professional attitude was epitomised in a recent article by Admiral Harper, who scathingly criticised Mr. Churchill's selection of an officer for a certain command on the ground that Mr. Churchill had said that his choice was based on personal impressions and conversations rather than on official records. Yet outside the closely regulated professions what employer choosing a man for an important post would not weigh personality more than record? Admittedly, the value of a choice based on personal

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knowledge depends on the man who makes it, and even at the best it is highly unfair to those who fail through no fault of their own to catch the selector's eye. But it is the only system, or lack of system, under which genius can be brought rapidly to the top. And the lesson of military history is that genius and not mere competence decides the fate of warring nations. It was the shrewd dictum of one who, whatever his defects, was assuredly a genius—Lord Fisher—that "favouritism is the secret of efficiency." In our zeal for fairness we have almost ruled out favouritism, and the stalemate of 1914–18 is a testimonial to our good intentions—which "pave the path to hell."

Favouritism, in contrast, will either give genius a chance or it will cause such thorough disasters that genius can rise from the ruins to rebuild the structure of the Army. Even reconstruction is better than slow decay. A drastic revision of the age-limits might be a palliative for the present congested state of promotion, but favour, exercised by progressive-minded leaders, seems the only cure. The theory of democracy suffered rude shocks in the war and has since been at a discount in the political world; in our Army where suitability for war is the sole criterion, the democratic theory is still more artificial. For inequality is the law of nature.

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CHAPTER XII

ECONOMY IN THE ARMY

"BORN 1919, died of an official chill 1925"—such is the epitaph that might be carved on the tombstone of the deceased Corps of Military Accountants. Fathered by the National Expenditure Committee of 1917–18, sponsored by the committee under General Sir Herbert Lawrence, nourished in infancy by the public desire to see a modern business system of accounting replace the admittedly wasteful previous system, or lack of system, its youthful prospects seemed bright. What, then, was the cause, or causes, of this early decease? Frankly, it must be said that the main cause lay in its failure to justify its existence by effecting any saving or more economical expenditure commensurate with its own cost of upkeep. Its failure could not be said to be due to War Office opposition, in fact the chill which ended fatally arose far more from the regimental officers, who were almost unanimous in their criticism of the new system as a failure, if not a fiasco, so far as effective results were the test. Nor could it be contended that the opposition sprang merely from inherent conservatism to change, for many of its firmest opponents were officers who had set an example in trying to effect economies in their own units. Their objection was rather that it did not prevent any waste

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directly and augmented it indirectly, both through its own cost and the extra clerical work it entailed in unit offices.

Let it be said at once that this negative result was in no way due to the personnel of the corps, a most conscientious and skilled body of officers and N.C.O.s who strove earnestly to justify their existence and to help the units with whom they were concerned. The kernel of the matter was contained in the funeral oration in the House of Lords: "In the first place, it did not displace the cash system, but produced another system on top of it, and the result was a great increase in the number of officials. The second objection was that it really failed to produce any system of costing accounts, as it was known in business and commercial circles." To some extent the former result was due to keeping two separate organisations, the Army Pay Corps and the Corps of Military Accountants, and had the amalgamation of these two bodies been carried out earlier the administrative expenses might have been reduced and the experiment have received a longer trial. It is true that cost accounting has not been abolished altogether, that while it disappeared from the combatant units it has been kept in "productive and other establishments," but the term "combatant" has received a wide interpretation to include military hospitals and ordnance depots. Thus cost accounting has disappeared in substance even if the shadow remains. If the practical failure of the cost accounting system, despite its theo-

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retical advantages, be recognised, no student of Army affairs can regard with satisfaction the return to the old system, hopelessly intricate, meaningless to the normal inspecting eye, and failing to provide any check on wasteful administration.

But we cannot hope for an economical Army so long as Parliament insists on adherence to the long-standing form of financial control. The real responsibility for wasteful administration lies, as Lord Haldane has pointed out, in the fact that the War Office is "held down by the tradition of that most conservative body, the House of Commons, and by the conditions of the Treasury"—last reformed in 1689, yet expected to fit twentieth-century conditions. The real indictment of waste in this "system which has been established by the authority of Parliament, and from which Parliament will permit no departure," lies against the body which refuses permission for real change.

The trouble which caused the breakdown of the new cost-accounting system was that it was an attempt to decentralise accounts without decentralising financial responsibility. Cost accounting is a success in business, because the departmental managers of any efficiently run concern are given a latitude which the commanding officer in the Army is refused. How can one expect senior officers to study economical management if they are kept in leading-strings throughout their career, treated as children whose self-evident wants are automatically

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supplied, and to whom is doled out a meagre pocket-money? Throughout the whole chain of military command are employed a host of officers and clerks whose time is inevitably spent in routine details, doing the same work over and over again because of this grandmotherly refusal of responsibility—a system as demoralising to character and intelligence as it is ultimately wasteful in public money. In fact, "the object of finance is not to obtain the maximum efficiency at a minimum cost, but the maximum observation of routine regulations out of a fixed sum of money."

Such a system has manifold ill-effects, besides the cramping of necessary changes which would lead to greater economy with efficiency in the long run. In these days, when economic factors are increasingly important, not merely as the cause but in the conduct of war, how can we expect officers to take this wider view who have had the gateway to it bolted and barred against them? Again, when the national purse-strings and Treasury control are loosened under the stress of emergency, the natural reaction from this fussy interference is a plunge into extravagant spending. Finally, even in peace-time it defeats its own ends. The common-sense alternative was well expressed by Sir John Keane: "...The Treasury should fix the sum and the executive officers should decide how it is to be spent. Those who know the facts must be allowed a free hand. Those who do not know the facts, like the Treasury, and try to control in detail,

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will be humbugged every time. . . . In business a proper system of cost accounts enables an employee to be placed in a position of responsibility with sufficient working capital, and to be judged by results." The present system defeats its own ends, because it compels "humbugging," and few officers who have served in the War Office or commands will deny either that this humbugging is relatively simple or that it goes on. The complete adoption of the alternative may be difficult, because business results can be estimated in cash and military results only by the more general test of efficiency, but some measure of decentralisation is simple and safe. The one radical objection, or obstacle, is that it would make redundant a very large number of Treasury officials.

Lest I should be thought to paint a wholly gloomy picture of future economy in the Army as it exists, to indulge purely in destructive criticism, let me outline certain practical suggestions which might lead to large savings even under the present system, and to still larger economies, with efficiency, if but a slight modification of the system be sanctioned. There are numerous able minds in the Army studying the question, eager to effect economies but powerless to do so.

First, the wider suggestions which do involve some change in the financial framework:

(*a*) Attach to every unit an expert accountant with a quartermaster-sergeant and four clerks —all accountants.

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(*b*) Give commanding officers cash at the beginning of each financial year to cover everything except a few inevitable "issues," e.g. ordnance, barracks services. Out of this the C.O. would have to pay all the numerous training expenses, etc., of his unit and to account for it he would have his accountant staff.

(*c*) Abolish all allowances and instead adopt this system: Fix standard rates of pay for married and unmarried officers, this including the average of allowances which have been paid annually to officers of his rank, based on a ten years' calculation. The officer would know exactly what his income is, that he gets no allowances, and that in the rare case of some unusual expenditure the case must be put up for consideration.

At present the multiplicity of allowances is a byword; officers are constantly claiming and wasting clerical time over petty sums of a few shillings, and to deal with these a large pay staff is employed in each command. Even without the partial decentralisation of financial responsibility involved in (*a*) and (*b*), money can unquestionably be saved in many channels, though not until we adopt the second can we hope to breed an economical sense among officers and train them for the economic responsibilities of war. Among possible savings which are worth consideration is that which would accrue from the concentration of the many specialist schools of instruction in one locality. Apart from the obvious saving in administrative expenses and

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fares, it would have the practical advantage of closer liaison between them, and do away with some overlapping, both in the theoretical instruction and in demonstrations. A centre like Shorncliffe, with Hythe and Lydd almost alongside, would seem feasible.

The Stationery Office would seem to be another field for economy. A small money allowance to units for the purchase of office requisites and writing materials would probably be cheaper than issues from the Stationery Office, while any review of Army forms and books discloses a large waste in paper and production. To give but two concrete examples to substantiate the criticism: Army Form G. 957, "Indent for Materials for Repairing Accoutrements," consists of twelve sheets, includes printed headings for all arms, is rendered in triplicate, so that by far the greater part of the form is wasted by any unit using it. Again, if one or two educational books are required, an A.F.L. 1389, consisting of five sheets of finest-quality paper, is submitted in quadruplicate! Many of the well-bound and expensive Army books could be replaced by a simple card-filing system.

Let us take a few other examples of waste, small perhaps in each case, but representing a considerable aggregate loss to the taxpayer. To conduct a small absentee from civil custody or to a detention barracks, an escort of an N.C.O. and a man are sent, often on a long rail journey. Surely if one policeman suffices in civil cases, an N.C.O. should be enough. Incidentally

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deserters or absentees might well have the cost of the escort deducted from their pay—the punishment fitting the crime.

Again, when a man is tried in a civil court an officer is sent to watch the proceedings, and if the case is in another district than the man's station, the strange officer who attends is both useless and a source of expense. A written statement from the man's own C.O. would be better and cheaper.

Courts-martial are another waste-tap. King's Regulations gives a list of offences for which a sentence of twenty-eight days' detention or less is recommended—ignoring the fact that a C.O. can give this, and that instead of letting him dispose of it, a D.C.M. has to be assembled at a cost of several officers' time, and also expenses if they have to travel from another station.

Much money spent in postage might be saved if a more thorough and co-ordinated use of dispatch-riders was made, and all letters for the various units in one station were sent to a central office for distribution and vice versa.

Recruiting is another channel of waste. Undesirables can pocket quite a useful sum from the public, by exploiting the regulations, which might be saved if recruiting officers were given power to withhold attestation, and consequently daily pay, while investigating the antecedents of potential recruits. Further, recruits have to be sent to medical examiners at certain centres, their rail fares a loss if rejected, and their examination redundant, because in any case they

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are re-examined at headquarters. In many barracks a huge waste of water occurs because screw-down water-taps are used instead of the hand-pressure pattern, and of electric light because old "vacuum" pattern lamps are used instead of "gas-filled." In fact, it may be said that through thousands of "taps" public money is running to waste, and if but a trickle in each case the total volume is a very considerable loss to the taxpaying public.

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PART III

RECOVERY AND RELAPSE

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CHAPTER XIII

THE POST-WAR DOCTRINES OF GERMANY AND FRANCE

So long as force remains the ultimate expression and instrument of national policies, a knowledge of the military doctrines and theories which sway the minds of our possible allies and enemies is essential to all who aspire to command troops in the event of a future war. Nor, surely, is this acquaintance with foreign doctrines needed only by the members of the General Staff. Casting the mind back to the last war, on what numberless occasions would it not have been an advantage for the regimental officer to possess an understanding of the tactical methods of the German infantry opposed to him or of his French allies!

Further, such knowledge is almost as vital to the educated civilian—to the statesman who is responsible for the security of the nation and to those who entrust him with this responsibility—not merely in order to form an instructed judgment upon questions of security, but in order to gain an understanding of the mentality which is revealed in these doctrines. The foreign regulations which serve as the basis of the comparison here attempted are the French "L'emploi tactique des Grandes Unités," the German "Führung und Gefecht der Verbunden Waffen," as well as the infantry regulations of both

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countries. In making a comparison it is, however, important to appreciate the different purpose and scheme of these books. The German regulations both in their scope and treatment are generally similar to our own, being intended for officers of all grades and concerned principally with giving detailed guidance for the conduct of the division and its parts, in war. The French "Grandes Unités," as its name implies, deals with the higher formations from the division upwards, and, being intended mainly for senior officers, assumes the reader's knowledge of the "mechanism" of movements and tactics. It is essentially a book of principles, and not a military encyclopædia or book of reference. When to the simplicity of this outline method of treatment is added the logical thought and clear expression characteristic of the French mentality, it is not surprising that the regulation is a masterpiece of clear-cut and simply-worded doctrine, steering a far more direct course than the other regulations past the pitfalls of redundancy and contradiction. Again, the British and German regulations deal with the processes applicable to any scale of formation, while the French one distinguishes between the tactics of an army, an army corps, and a division, and treats of each separately.

A further feature of the French regulations, which might well be imitated, is the use of an introductory report to discuss and make clear the experience and ideas on which the doctrine is based. By this means the reader is informed

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as to the conditions that the doctrine is framed to meet, and the actual text of the book relieved of repeated reservations and vague generalisations, which blur the mental picture that the reader forms. The basis of the French doctrine is found at the end of this report, where it is stated that the book deals with a war of the first magnitude against an enemy of equal degree of organisation, and relegates to other books the subject of wars against an inferior enemy.

It is notable that the German regulations take the same standpoint, refusing to regard as permanent the limitations of size and deprivation of aircraft, tanks, and heavy artillery imposed at Versailles. In a striking preface by General von Seeckt, who until the recent political crisis was widely regarded as the " man of destiny " who would rebuild the German power, it is laid down that " These regulations are based on the strength, armament, and equipment of the army of a modern great military power, and not only on the German Army of 100,000 men formed in accordance with the Peace Treaty."

It may not be without value to draw attention to the circumstances of Von Seeckt's career, for it affords a clue to the underlying ideas on which the German doctrine is founded. After a short spell on the Western Front as chief of staff of the IIIrd Corps he then went to the Russian Front, where, as chief of staff of Mackensen and the Archduke Charles, his was the brain which worked out many of those bold and successful

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enveloping attacks which crippled our Eastern Allies. After spending the winter of 1917 at the Turkish General Headquarters, he returned as chief of staff to Otto von Below. After the war, as Commander-in-Chief, directly responsible to the President of the Republic, the German military power was more completely centralised in his hands than was the case with any previous chief. Von Moltke and Von Schlieffen never exercised, as did Von Seeckt until his fall, undivided control over the administration, training, and direction of the German Army. His disappearance may be only temporary, and at least his influence is lasting.

It is probably in no small measure due to his experience on the Eastern Front that mobility, manœuvre, and surprise are the keynotes of the German doctrine. The emphasis on these factors, as also the attention devoted to cavalry and the encounter battle, may also imply that Germany still cherishes the dream of expansion in Central Europe and still farther.

In contrast, the French regulations are absorbed above all with the dominance and development of fire-power, while our "Field Service Regulations" blend both aspects so subtly, perhaps too subtly, that not one of these lessons is impressed deeply on the reader's mind.

Von Seeckt makes it clear that these are the main expedients by which the German Army hopes to compensate for her present deficiencies in aircraft and tanks, as well as in numbers. In paragraph 15 of the regulations we read: "Inferi-

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ority of numbers must frequently be counterbalanced by greater mobility. In this connection the marching capacity of the troops, the use of railways, of motor and other transport, as well as the utilisation of darkness as a concealment for movements, will play a great rôle." Another counterpoise emphasised by Von Seeckt is that: "Troops must learn, above all else, to conceal themselves skilfully from aerial observation by means of camouflage." It is noteworthy also that, although forbidden tanks, numbers of dummy tanks play an important part in all their tactical exercises.

A strong impression is gained from examination of the German regulations that another expedient on which the Germans count is the use of gas. Unlike heavy artillery or tanks, there is no difficulty in keeping its production secret. Its rapidity and economy of production are superior to those of any other weapon, for it is the only one which is a commercial product, manufactured from chemicals which are an essential requirement of peace-time industry; the difficulties and delays of establishing a special plant are thus avoided. Nor does it require the prolonged training of a large personnel, as do missile weapons which demand an expert aim to hit the target effectively.

The French regulations preface the subject of the employment of gas with these words: "Respectful of the international agreements to which France has subscribed, the French Government will endeavour at the start of a war, and in

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accord with its allies, to obtain from the enemy Governments an agreement not to use gas as a military weapon." The "Field Service Regulations" were more cryptic, qualifying its employment "as a matter of consideration by the authorities concerned before a campaign begins," but neither the French nor British regulations go so deeply into the methods of using it as do the Germans, where its use is regarded as a matter of course. Its tactical employment in "surprise gas attacks," against strong points such as villages and woods, against artillery, against assembly positions for reserves, for the gassing of areas in defence and to hinder enemy preparations, are all carefully regulated. In the infantry manual, again, no fewer than four pages of close type are devoted to the subject, expounding its offensive uses under the thin disguise of studying how an enemy would be likely to employ it. The use of shell-gas is considered uneconomic except where the position of the enemy is known exactly, or at points where a sudden diffusion of gas may yield important tactical advantages.

In mobile warfare its employment is declared to be limited to three purposes. First, "to make impracticable certain parts of the terrain that the command wishes to keep free of enemy troops for a time," as, for example, to hinder the enemy approach by "pushing forward several batteries, whose gas projectiles will be carried on motor transport, and which will cover with gas the bridges, obstacles or mountain passes." Second, in the attack, "certain specially designed bursts,

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to overcome machine-gun nests, mortars, and supporting guns." Third, in the defence, the establishment of a curtain of gas immediately before the enemy assault is launched. In position warfare, "gas action acquires a much greater importance . . . the attack, in quitting a position, will be supported by a gas attack intended to encircle the opposing artillery. . . ."

So great is the attention paid by the German doctrine to surprise, mobility, and manœuvre, that it may be useful to enlarge upon its treatment of these subjects.

"Every action," says the German infantry manual, "ought to be based on surprise. Without surprise it will be difficult to obtain great results." "Surprise is effective not only at the start, but also and in the same degree during the whole course of an action, and for all the measures taken by the heavy and light infantry weapons, and by the groups of riflemen. This rule applies also, in the smallest scale, to the bursts of fire of machine guns, mortars, infantry guns; for the sudden shot of the isolated rifleman; for the rush forward in making a bound; for breaking into the enemy position, and for the counter-attack." The manual shows the various methods of assuring secrecy; it recommends that surprise should further be sought in constantly varying the employment of the infantry weapons; ruses and wiles of every kind ought always to be used to deceive the enemy. . . . A good leader is inventive in the choice of his means of action.

With the object of surprise, they even recom-

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mend altering the dispositions during the night and at pauses in the battle: "The position of the defending groups should be changed at intervals, so that the enemy is constantly faced with new problems." They place the principal means of defence away from the network of fire and communication trenches; and they insist on the use of camouflage. In this connection, it may be of interest to quote an officer who witnessed the manœuvres of the 3rd Division: "The men had dug individual fire-pits, with perpendicular sides, and had camouflaged them with branches and foliage. They had even entwined it round their helmets and over their packs. It was necessary to come right up to the men to discover their emplacements." Machine guns and even light automatics are equipped with painted coverings in several colours; while the men are trained to smear their hands and faces with earth.

It may be remarked that these are only details, but it is the sum of these little things which reveals an army saturated in the principle of surprise.

Next we come to the subjects of mobility and manœuvre, the means to surprise in time and space respectively. We have already spoken of the emphasis laid on the use of railways and motor transport to this end, as well as on training. Yet another means to which the Germans attach importance is a thorough technical development and expansion of a closely linked system of liaison and inter-communication. Aircraft,

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motors, telephone, telegraph, wireless—with restrictions on account of its lack of secrecy—cyclists, lamp signal-flares, semaphore, sound and ground signals, message shells, carrier pigeons, messenger dogs, chains of runners, mounted orderlies and liaison officers, all are utilised to the full in the network of communications. The degree to which this system of transmission is carried is also shown by the fact that even the German infantry regiment has a signal company comprising 270 men, 38 vehicles, more than 100 telephone sets, 30 visual and 4 wireless sets. The forward position enjoined on commanders of all grades, and the extremely detailed instructions on the method of drawing up orders and reports, are also designed to accelerate this mobility and quickness of manœuvre.

While the French organisation does not appear so developed, their broad treatment of the subject would indicate that they have thought out the problem of inter-communication scientifically. They lay down, with regard to it, that "the principle of its organisation rests on the establishment of an *axis of inter-communication* pushed as near as possible to the fighting line." "On this axis is established an *advanced information centre* . . . intended to keep the divisional commander informed as to the progress of the action. . . ." It "is frequently established alongside the commander of the divisional infantry. . . . In certain cases it can be pushed farther forward to allow of direct observation of the battlefield." Again, in their infantry

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manual, the French have adopted the idea that each infantry commander, down to the group, should employ a liaison agent to keep him in touch with the situation of his sub-units, whose commanders, busily occupied, often delay to send back timely reports; this method of *liaison forward* was actually inserted in the original draft of "Infantry Training," but was subsequently deleted, and even the hard experience of manœuvres in the slowness of information has failed to get it reinserted. When it is remembered that the early gaining of information is the crux of modern battle, and vital for the exploitation of success, it may be conceded that both the French and German methods hold lessons of value.

It is, however, on the subject of manœuvre that the German doctrine stands out in the most striking contrast to the French, and, in less degree, to our own "Field Service Regulations." It is curious that an Army like the French, which has been nourished on the Napoleonic tradition, should now pay so little homage to the idea of manœuvre, but presumably they visualise a repetition of the last war with its continuous front. The Germans, on the other hand, compulsorily restricted in numbers, and perhaps realising also that the dense masses of 1914–18 were an encumbrance rather than an asset, aim evidently to replace quantity by quality, and to release the power of manœuvre from its recent fetters by the skilful handling of smaller forces of superior mobility and training. It would seem

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that in this way only can the art of war, suffocated by unwieldy numbers, be revived.

But if the German doctrine holds fast to the idea of envelopment, both strategical and tactical, it seems less enamoured of the double envelopment—the Cannæ and Sedan pattern—and more infused with the necessity for thoroughly fixing the enemy. The formula of *Fixing combined with Decisive Manœuvre* is the underlying idea in all its prescriptions. "Above all, it is necessary to determine if the envelopment of the enemy is possible, and at what point. This process, employed concurrently with a vigorous fixing attack from the front, gives the most certain assurance of success." "To provide against the vicissitudes of battle and to ensure a decisive success, the troops destined for the envelopment should be as strong as possible. The front is attacked with weaker forces. The art of leadership is to judge exactly what minimum of force will suffice for the frontal attack, and how much must be allotted for the envelopment." Later we read: "It may be important to hold mechanical transport columns ready in good time for the decisive employment of the reserves."

Then, dealing with the deliberate attack: "When the situation has been cleared up, the commander determines if he can take the position by envelopment. He should always seek this solution. On all occasions it is essential first to attack the enemy from the front, in order to fix his forces."

But even where a frontal attack is unavoidable,

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the Germans emphasise the possibility, by exploiting a penetration, of "attaining at least a local envelopment." Even in the case of the small infantry units in a large-scale attack, their doctrine lays great stress on the process of *fixing and manœuvre* to effect a convergent attack on the opposing nests and centres of resistance.

The French here seem retrogressive, for they still hold to the idea of direct reinforcement and lay down that "the offensive power of the unit is always maintained by the gradual fusion of the reserve into the echelon of fire." With us, at any rate, that murderous phrase "building up the firing-line" is anathema, and we realise that organised defences can only be overthrown by augmenting the mechanical fire-power, and not by increasing the density—and casualties—of the infantry.

The German doctrine, moreover, is emphatic on the subject of infantry manœuvre: "Fire from a flank multiplies the effects of the projectiles and shakes the nerves of the enemy, who are compelled to face and defend several sides at once; this fire is particularly effective when it is combined with frontal fire and when executed by surprise. . . . The flanking action of the small units and of the heavy infantry weapons, by passing at need into the neighbouring sector, facilitates the advance. The fire and the movement, the frontal and the flank action, ought to alternate and be combined. . . ." "Even with the smallest units, outflanking manœuvre

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should be aimed at by dividing them and making them converge towards the same objective. The wide distribution of the troops of defence and the gaps that it offers facilitate local outflanking manœuvres on the part of the assailant, who will enlarge by force the intervals which exist or that have been created through the capture of a strong point or a post. . . . "

In the part dealing with the battalion attack the subject is expanded, and we see that large intervals between the units and an accentuated distribution in depth are some of the means to this end. The advanced troops are to be very weak in numbers, but with a leading fringe of light automatics, and supported by heavy machine guns. It is even advocated that when only one flank of the battalion is supported, a few heavy machine guns may be used to fix the enemy from the front and the mass of the battalion thrown against his flank.

The probable key to the contrasting attitude which the French tactical doctrine offers not only to the German, but to our own, is to be found in their report to the Minister of War, when it is stated that " of the two elements fire and movement . . . fire is preponderant." In comparison, our manuals lay equal stress on each, while, although the Germans exalt mobility, they study the application of fire-power with a thoroughness perhaps superior to either of the other armies. Another French dictum is that " in order to advance in spite of the enemy, it is necessary to have superiority of fire." This is

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reminiscent of the old idea of a general fire-fight from a definite line preceding a general assault, and seems to overlook the irregularities of fire and of resistance which lead to the successive local assaults and progressive penetration characteristic of modern battle. This, again, supplies the clue to the difference between the French views on the one hand, and the British and German on the other, as to the phases of the attack, which we shall deal with later.

Before we turn to consider the rival ideas on the phases of attack and defence, it may be useful to sketch the divisional organisations. The French division includes either three or four infantry regiments, of three battalions each; a squadron of cavalry; two regiments of horse-drawn artillery; an observation squadron of aeroplanes; a battalion of pioneers; and a divisional school. The tanks are part of the army corps, which has a regiment of light tanks; in the regulation, however, they are dealt with under the heading "infantry," and are treated solely as an infantry weapon. This purely auxiliary rôle, if partly due to the slow speed of the present French tanks, hardly seems consistent with economy of force, and is perhaps a consequence of the excessive attention to fire-power compared with mobility.

The infantry battalion comprises three ordinary companies and one machine-gun company with a section of accompanying weapons (mortars or guns). The company includes four sections, and the section three groups.

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The tactical distribution of the division is in three echelons: the battle echelon, usually entrusted to the *infanterie divisionnaire*, who commands all the infantry of the division; the main body of the artillery, under the *artillerie divisionnaire*; and the divisional reserve.

The German division includes three infantry and two artillery regiments, a battalion of pioneers, and two flights. The infantry regiment comprises three battalions, a *minenwerfer* company, a 6-gun battery of "77's," and a signal company.

The battalion consists of three companies and a machine-gun company, and the company of three sections.

Finally, let us trace the national doctrines through the sequence of operations. This sequence is more clearly brought out in the French regulation than in any other, although our own is certainly less confused than the German regulation. The French divide the phases into: (1) Exploration—by aircraft and cavalry, to determine the zone where the enemy is likely to be met. It is laid down that the dispositions during the approach should be adaptable to the projected manœuvre; they comprise a first-line formed of the army corps whose mission is to assure room for the deployment of the Army, and a second line formed of the army corps and special arms destined to constitute the reserve and to manœuvre. At the outset the formation should be wide and deep, for ease of movement and changes of direction;

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"the nearer one gets to the enemy, the more should the force be closed up, particularly in depth." (2) The second phase consists of making contact with the enemy. During this "the commanders of the leading army corps reinforce the fire-power of their advanced guards, which thenceforward form the leading echelon of their battle dispositions." (3) The former phase merges imperceptibly into the phase of engagement—which enables the army commander to crystallise his plan of attack and the points against which he will concentrate.

The French treatment of these phases seems the most true to reality; it avoids any artificial separation between the approach and the attack, and the inelastic idea of prearranged concentration areas. Their precepts on dispositions and direction during the approach might well find a place in "Field Service Regulations."

On the subject of cavalry we again find doctrines influenced by their respective war experiences. The French have swung furthest from the idea of cavalry action, in the true sense of the term. The horse is regarded essentially as a means of movement, enabling the rapid concentrations of dismounted fire-power to be effected; a method of transportation on which, moreover, their doctrine still places a high value, regarding the horse as more handy and possessing a more complete power of movement over the terrain than the road-bound lorry or their obsolete model tank. Like the other armies, too, they consider that aircraft, though now supreme for

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long-range reconnaissance, have not replaced cavalry for detailed close reconnaissance and cannot do so. But mounted action, save in exceptional cases with small units, is for them a dead letter. This is the more striking because before 1914 the reverse was the case, the French stressing shock action by cavalry masses more than any other army, and dismounted action only as the exception and by the smaller units almost exclusively. With fire-power as the keynote of their doctrine, for cavalry as for the Army as a whole, the French have given their cavalry such an immense increase in fire-weapons of every kind, automatic rifles, machine guns, "75's" and "105's," together with armoured cars, that their cavalry division is but a highly mobile form of an ordinary division.

The Germans, seemingly influenced by the wider experience of their Eastern Front campaigns, foresee a wider rôle for cavalry formations, and appear to believe in a higher proportion of this arm than the French. Nevertheless they, too, insist that fire-action is the principal method and that the cavalry must be reinforced by no less a quantity and variety of auxiliary fire support: "The cavalry has an important strategical and tactical rôle, which consists in concentrating rapidly a heavy fire-power on the enemy's vulnerable points. This rôle is based on the great mobility of cavalry and on an abundant provision of fire-weapons of every kind." "The effect of fire-weapons has made mounted action by large units impossible. But

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in a narrower sphere, cavalry detachments are able to charge the enemy on favourable occasions; for example, the attack of disordered infantry, surprise of cavalry." "Once the war of movement has begun, the chief rôle of the cavalry of the army consists in the envelopment of the flanks of the enemy's army, more than in strategic reconnaissance and throwing back the opposing cavalry." "These long-range enterprises of large cavalry bodies, on the rear communications, often offer to cavalry a rich and remunerative field of activity. It is then necessary to reinforce them heavily with mobile troops (cyclists, motor-borne infantry, artillery)." In the pursuit, too, the Germans lay emphasis on the efficacy of large cavalry bodies advancing on routes parallel to the enemy's retreat and delivering constant flank attacks, as well as to seize defiles and bridges in his rear.

In the details of exploration the Germans show their characteristic thoroughness, and their views on the relation between cavalry and air reconnaissance are of interest. They visualise a high proportion of mobile and mechanical troops with the advanced guard, as well as long-range artillery; they suggest the advisability of a short withdrawal of it, to avoid costly premature engagements and to shorten the time of deployment; and they deprecate their historic formula of "marching towards the sound of the guns," in the attempt to effect a junction on the battlefield. The Germans also advocate a more forward position for commanders than

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do our "Field Service Regulations"; they point out that "a position too far to the rear increases the distance for the transmission of orders and reports in spite of the greatest perfection of the means of communication," and they place great importance on the commander, of the whole force even, exercising a personal influence and being seen by his troops "when a decisive moment is at hand." In the case of the division "it is desirable that a view of the battlefield should be obtainable from battle headquarters."

One important difference between the French and German views on the phases of battle, which doubtless exercises an effect on the emphasis placed by them on fire-power and mobility, is that after contact has been made the French visualise the approach, preferably under cover of darkness, as gaining a general jumping-off position from which a prepared assault will be delivered, while the Germans appear rather to foresee the approach combat merging into local assaults, followed by a steady breaking through the enemy position by infiltration and outflanking of the centres of resistance. This conception naturally results in a greater reliance on the infantry, whom they equip for the task by a lavish provision of immediate fire-support, in the form of heavy machine guns, *minenwerfer*, and infantry batteries. Both in mobile and static warfare they ban the use of "broad, thick lines of riflemen," . . . "infantry should not break through in lines . . . but in light

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groups and in changing formations adapted to the nature of the ground."

A sound German idea is that "every attack has its *centre of gravity* which should be noted in orders."

This forms the basis of the original distribution, but when the attack develops the Germans understand the need of flexibility, for they rule that "reserves should, above all, be pushed in to exploit where a success is gained, even though it is necessary, by so doing, to shift the original centre of gravity."

An important point emphasised in both the French and German regulations, but omitted in our regulations, is that the commander's simplest means of fulfilling the principles of concentration is by the allotment of narrow frontages to the formations intended to deliver the decisive blow and broad frontages to the others, so ensuring that the former have "the power of pushing their effort more deeply" ("*Grandes Unités*"); as the Germans point out, "by means of the reserve he can transfer the centre of gravity to any desired point."

The German doctrine on the use of reserves in the exploitation of success is that when a penetration has been made, "the first duty of the attackers is to continue the progression in the same direction. . . . The reserves, following close upon their heels, should also pursue in depth. The decisive thrust is weakened and the result diminished by wheeling too rapidly," the task of rolling up the flanks being left to reserves

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other than those of the attacking force. On this vital point of *direction* the French regulation, like "Field Service Regulations," is obscure and even gives the impression that the exploitation in breadth is to be executed by the leading troops.

On the subject of pursuit the Germans insist on the importance of the highest concentration of artillery fire, and of infantry in motor-lorries closely supported by infantry batteries. They also plan a heavy attack of all available aircraft against the hostile main body at the moment of assault and during the pursuit—when they will also be directed against the roads and railways in rear. "Field Service Regulations," however, alone seem to have grasped the potentialities of tanks for disorganising the enemy's staff arrangements and communications.

All three Armies are agreed on the greatly increased importance of artillery, and here again German thoroughness is evident in their exhaustive examination of the action of artillery in all cases. While the French divisional artillery is usually divided into a part for *close support*, and the other for *general action*, in the form of special concentrations of fire and protective fire at longer ranges, the Germans in addition have special infantry batteries allotted to regiments, but generally transferred, by sections or by guns, to battalions, and even to companies.

In defence, while the Germans limit the depth of the sectors "by the principle that it is necessary, above all, to break up the enemy attack before

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it reaches the position," they are insistent that the artillery and the infantry units, down to the smallest, must be strongly organised in depth, and the number of men reduced by a plentiful use of machine guns.

Both they and the " Field Service Regulations " place greater importance on counter-attacks than the French ; it is curious that the latter, famous as the exponents of movement rather than stationary fire, should now pin most of their faith to the latter and even contemplate as normal the reinforcement of the firing-line.

In view of the last war, the German views on anti-tank defence are of special interest. Likely approaches are to be harassed by artillery fire, and then, at close range, in the first line will be placed the infantry guns, the *minenwerfer*, and, close behind, anti-tank machine guns ; the use of clusters of grenades thrown in front of the tracks is also advocated. The infantry accompanying the tanks are to be the target of the riflemen and light automatics. In the static defence, the Germans plan an extensive use of ditches, barricades, and mine-fields. They also advise the employment of special mobile anti-tank reserves, comprising field guns, light *minenwerfer*, and machine guns with armour-piercing ammunition, moved on horsed wagons or motor-lorries.

A special feature, for use also against the assaulting infantry, is the proposal to dig in single guns or sections well to the front, to remain hidden until the last moment ; it is ruled that the

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infantry batteries should not be used for this purpose, but be kept mobile.

That the confidence displayed by the regulations in the effectiveness of these anti-tank measures is not shared by all was shown by a recent discussion in the "Militär Wochenblatt," where one side pointed out that supporting artillery, at 1,200–1,800 yards from the leading infantry, failed to give the necessary moral support, while the other side argued that infantry batteries, while effective against isolated tanks, could not cope with large masses of them; and both sides finally agreed that the best anti-tank weapon was the tank. German military opinion appears to have executed a *volte-face*, since the war, as to the value of tanks.

In summing up one's impressions of the doctrines of the three countries, it is felt that the French are unduly influenced by the lessons and conditions of 1914–18 on the Western Front, with its closed flanks, unwieldy numbers, and enormous armaments, while the German horizon is widened by a well-balanced appreciation of the experience on their Eastern and South-eastern Fronts, and ours by the knowledge of the varying theatres which are rendered possible by our Imperial problems. There is a natural inclination to prefer the German doctrine to the French, because of its attention to the principles of surprise, mobility, and concentration, through manœuvre, which have ever been the instruments of the Great Captains, and are the soul of the military art. The German doctrine, also, is more

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in accordance with our own, though it carries mobility and manœuvre to a higher pitch. While the British and German regulations are, however, full of "meat"—almost indigestibly so, in fact—one cannot but pay tribute to the transcendent clearness of expression and arrangement which distinguishes the French doctrine, and to the supremely logical thought with which it traces a path through the morasses of military detail.

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CHAPTER XIV

THE RIVAL THEORIES OF DISARMAMENT

PUBLIC opinion, watching the course of the Preparatory Commission on the Reduction and Limitations of Armaments at Geneva, may, not inexcusably, have been bewildered by the confusing technicalities of the debate. But it would be a pity if it were not widely recognised that behind all the variety of arguments there are two basic theories of disarmament, sharply conflicting but each grounded in reason. It is wise to study the foundations of both in order to clarify the issues.

Briefly stated, the British and American view is that the existing armed forces of a State should be taken as the starting-point from which disarmament should proceed. The French theory is that the basis of calculation should be the potential war-strength of a nation—not only her present armed forces, but the size to which her man-power could raise them, her industrial capacity for munitions, her railways and maritime communications, taking into consideration also her geographical situation and the natural strength of her frontiers.

The logic of the French theory is unanswerable in the light of war experience. The war began in 1914 as a conflict between professional forces, swollen, it is true, owing to the Continental

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system of conscription, yet essentially fought out by soldiers, while the mass of the people watched, from seats round the arena, the efforts of their champions. The Germans alone had a glimpse of the truth, but the "nation in arms" theory evolved by them during the nineteenth century visualised the nation rather as a reservoir to pour its reinforcements into the Army than as a mighty river absorbing many tributary forces, of which the Army and the Navy were but two. Only after the first attempt at a quick decision had failed did the "nation in arms" gradually evolve into the "nation at war"—with industry, finance, and, not least, publicity playing as vital a part as the armed forces.

To reinforce their theory the French have only to quote the examples of Britain and America, who, starting with practically no armed forces apart from their Navies, ultimately exercised a decisive influence on land and in every other realm of war-effort. It is doubtful whether under modern conditions the hands of the clock of civilisation can be set back, whether the world can return to the old method of "gladiatorial" campaigns. For, with the progressive integration of Governments and peoples, war is no longer a mere conflict of governmental policies, but of peoples, and no democratic Government would dare or be able to go to war unless assured of the support of the nation.

The soundness of the foundations of the French theory is clear, and the fact that it is framed with an eye on a neighbour, whose potential industrial

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and man-power resources heavily outweigh those of France, does not impair the justness of the abstract principle. But while the calculation of armed forces is simple, that of national war-power is so complex, so controversial, that a basis of armament threatens to become a mirage in the European desert—a negative result which might not be altogether unwelcome in some quarters. Not for the first time, logic proves a deceptive guide to any tangible goal.

The instinct of the British and American delegates is more true to the reality of disarmament, if not of war, when they seek to confine the discussion to measurable elements of force. Unfortunately, their specific pleas are damaged in the eyes of continental peoples by the fact that their adoption is obviously to the direct advantage of Great Britain and the United States. It is difficult for a country whose people are rooted to the voluntary principle to preach the abolition of compulsory military service to others where the people agree that it is the duty of every citizen to defend his native land. It is still more difficult for a rich country whose naval strength has always rested in her battleships to beg others to abolish the submarine, a new weapon which redresses the balance to the advantage of inferior naval Powers and those who cannot afford to build battleships.

We may know that the pleas of the British delegates spring from genuine idealism, and we may feel that by the sacrifice at Washington of our battleship predominance we have given

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proof of our honesty of purpose, but less idealistic foreign critics will look only to the experience of the war, which showed how an inferior naval Power, labouring under every geographical handicap, could bring us to the verge of defeat by the use of the submarine—a weapon supremely suited to the narrow seas which flank the coast of Europe.

And in an atmosphere where material rather than moral arguments are too obviously the governing factors, beneath the surface, we have thrown away, by the prohibition of gas, the one lever which an industrial Power can use in argument with a military Power. For the introduction of chemical warfare not only impairs the value of armed forces, based on rifle and gun strength, but promises to bestow military supremacy on the great industrial nations, the nations who devote their peace-time energy to the expansion of industry rather than to the expansion of armies. Yet, given the general desire for security, there are arguments for the abolition of conscription which, if appreciated, might influence the attitude of the Continental countries.

A conscript army is inherently less ready for war than a professional army, and therefore more conducive to war. The explanation of the paradox is that the loss of time has to be made up by rapidity of mobilisation in order not to be caught at a disadvantage. Now, the mobilisation of a vast citizen army is a process impossible to camouflage, and compelling other

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nations to follow suit. It is a threat, and in such an atmosphere pacific negotiations are difficult if not hopeless. Between negotiation and mobilisation there is a gulf; between mobilisation and war a mere seam, across which the act of any irresponsible can draw the nations.

In contrast, a professional force has the quality of constant and unprovocative readiness, and is thus no more menace at a crisis than at a time of quietude. The unnoticed sailing of the Grand Fleet for Scapa on July 29, 1914, may well be compared with the furore caused by the mobilisation of the continental armies. A second argument is that both the experience of the war and the progress of mechanisation tend to replace the old military doctrine of quantity—weight of numbers—by one of quality. Nations can afford masses of conscript infantry, but they cannot afford to maintain in peace more than a small mechanical army, and conscription is futile if the "footslogging" levies so raised are as helpless against professional tank-men as were the peasant hordes of the Middle Ages against a handful of armour-clad knights.

The critic may say that as the war continues these conscript masses could be equipped with mechanical weapons, but the mobility and striking power of small professional forces of mechanised troops promise a decision long before the civilian peoples could merge themselves in the struggle. The restoration of war to a

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professional basis may limit its ravages, as well as retard its outbreak, by giving time and a better atmosphere for negotiations. Where the moral appeal to the countries of Europe, suffering from an insecurity complex, seems likely to prove ineffective, the military argument may ultimately prevail.

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CHAPTER XV

FRENCH ARMY TO-DAY

I. *Its Doctrine of War—The Impress of* 1918

If to know your goal is a good step towards attaining it, the French Army is more fortunate than the British, which, except during the decade preceding 1914, has been treated as a general handy-man, with any and every part of the world as its possible theatre of war, and hence no clear-cut purpose for which it can be trained nor policy on which it can be organised. The French Army to-day, as for half a century past, has its face turned towards the Rhine, with disquieting assurance, yet without trepidation, that there lies the foe of to-morrow, as of yesterday. To prepare itself to withstand the fresh trial of strength, of which instinct and historical reasoning warn it, is the keynote of French military policy. To grasp this is essential to the understanding of the doctrine on which the Army is being trained. I would make it clear that the reference is purely to the technical sphere, and not to the political; it does not mean that the French have any desire, or even willingness, for such a renewed trial. Indeed, I am convinced that they are essentially unmilitaristic, that they have no wish to don Germany's cast and threadbare mantle of military ambition, and that sheer

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distaste for war is the motive underlying all their repressive and defensive measures.

With this preface, one may continue, and say that, from the point of view of French military tactics and organisation, November 11, 1918, was simply a break in a serial, " to be continued in our next." Their horizon is bounded by the armaments and conditions of the Western Front in 1918. Herein lies the clue to their extreme emphasis on fire-power, which leads their official regulations to declare that " of the two elements, fire and movement . . . fire is preponderant." And in their tactics all else is subordinated to the production of an overwhelming volume of fire. Their infantry division, and regiment, are still the profusely armed but complex organs of practically war-time pattern. Their exercises, large or small, are normally designed to bring out the action of a unit *encadré*—that is, with other units on either side limiting its frontage, and hence its possibility of manœuvre. In brief, they are aiming, consciously or unconsciously, at the production of a powerful but rigid fighting machine, rather than a flexible instrument which will give scope for the gifts of an artist of war.

Let me briefly survey the tactical doctrine of the various arms. In dealing with the infantry there is a noticeable divergence between the letter and the spirit of the manuals, for, while they say that " the infantry is the principal arm," they dilute the impression by repeated emphasis on its dependent rôle—" the experi-

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ence of the war has clearly proved that, to accomplish its mission, infantry cannot fight alone, and that the support of the other arms is indispensable"; "fire-power renders impossible every advance, even in dispersed formation, if the ground can be effectively beaten by fire"; "an advance weakly supported by artillery, and *a fortiori* not supported, can only be attempted against an enemy in a definite state of inferiority."

Moreover, it is these reservations, and not the original declaration, which serve as the foundation upon which the practical organisation is built up, storey by storey. Their combat unit is the group, consisting of thirteen infantrymen —divided into a rifle team and an automatic rifle (*fusil-mitrailleur*) team. But it "is no longer estimated in 'rifles,'" but as the personnel of an automatic weapon "necessary to move it, serve it, feed it, protect it." Thus the old conception of infantry is abolished, and the counting is not by "heads"—or rifles—but by automatic weapons. If so, the logical deduction must surely be that an automatic weapon served by two men, moved by a motor, protected by armour-plate—in other words, a tankette—is as effective and vastly cheaper than thirteen men on their feet. This was evidently appreciated by the Commission which in 1919 compiled the new infantry regulations, for in their report to the Minister of War appears this significant surmise: "Will this lead in the future to a still further reduction in the group, constituted of two

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or three men enclosed in an armoured and mobile shell ? "

It is known that the late General Buat, post-war Chief of the General Staff, and one of the ablest military brains in Europe, shared such views, and gave emphatic expression to his opinion that the tank would be the basis of future armies. But since his untimely death this vision seems to have made little headway towards realisation, and has been slower to permeate military thought than in this country. It may be because in France these ideas were sprinkled from above, whereas with us they were like springs welling up from below.

Here, however, we are concerned with the existing facts, not with their logical inference, and our next step is to show the fighting-power of the French infantry battalion according to their own standard of valuation—by number of automatic weapons. Nine *groupes de combat* at peace strength, twelve at war strength, make up an ordinary company ; and, instead of the four ordinary companies and one machine-gun platoon of a British battalion, the French has three ordinary companies and one machine-gun company—sixteen machine guns to our eight. To augment still further the self-contained fire-power of infantry, the regiment—of three battalions—has a section of " infantry guns," three 37-mm. guns and three Stokes mortars.

The French tactical methods are likewise influenced by their dictum that fire-power is the preponderant factor and by the memory of the

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strictly defined frontages of 1918. The outcome of such a blend is to subordinate the idea of manœuvres to that of building up a moving wall of fire—" the offensive power of the unit is always maintained by the gradual fusion of the reserve into the echelon of fire." This doctrine of more or less direct reinforcement, rather than outflanking manœuvre, leads in turn to their conception of future battle as a preliminary fighting approach which will gain a jumping-off position for a deliberately prepared assault against the enemy's main resistance. Similarly, whereas our manual suggests 1,500–1,000 yards as the frontage of a battalion in attack, the French is from 800 down to as narrow as 800 metres. Such narrow frontages may in theory ensure the dense volume of fire on which the French pin their faith, but in practice it would seem to expose such thick numbers in the fire-swept zone as perhaps, through increased casualties, to nullify its own purpose. I cannot quite see how the French, a people renowned for their logical thought, can reconcile these frontages with their arguments for a lavish use of material in order to economise in men.

In defence, also, the French infantry lay the major stress on the organisation of a network of static fire positions, even regarding as normal the reinforcement of these by the reserves, and they place far less reliance on mobile counter-attacks than do either ourselves or the Germans. Yet within the limited scope which they allow to movement, it is just to say that the French,

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in their post-war training, have done much to improve its elasticity and to reduce loss by skilful use of ground and formations. And, to this end, they have set the military world a most practical example by discarding altogether the old-type drill, with its obsolete and unarticulated lines, and basing their drill instead on modern battle movements and developments. Thus what is learnt on the parade-ground has not to be unlearnt on the battlefield.

Next to, or rather with, the infantry must be considered the tanks, for in the French Army they do not form a separate arm, but are treated as a sub-division of the infantry. Here, again, the main cause appears to be the persistent influence of 1918, if partly also due to the fact that their standard machine is still the slow-moving Renault light tank of the war. From its inherent limitations springs the official doctrine that "tanks are incapable of carrying on the fight by themselves. But they form an extremely precious and powerful reinforcement for the infantry. . . . The rôle of the tanks begins at the moment when the infantry is at assaulting distance. The tanks then turn the centres of resistance which the infantry meet, in strict co-operation with the units with whom they are acting." In the assault they advance immediately in front of the infantry, who "ought to go everywhere the tanks go" and make it a point of honour never to let a machine fall into the enemy's hands. The French tanks are, in fact, armoured infantry "pill-boxes" put on

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tracks, and so endowed with the power of movement at a foot-soldier's pace. And although they are nominally corps troops, the normal practice is to attach a tank company to an infantry regiment, so that, like the section of "infantry guns," it forms part of the extra fire-power of the regiment. The company has three fighting sections, each of five tanks, which is the combat unit, and is never broken up; one or more sections may be put at the disposal of an infantry battalion in the assault. But the phrase "extremely precious," quoted above, seems in practice to be interpreted as meaning that the tanks are so precious that they must be hoarded until the infantry have reached the end of their tether. This may prove false economy, for "man is the most costly article in war," and the ultimate financial cost of losing a Renault tank, with its crew of two, would be less than that of three infantrymen.

With such emphasis on fire-power and so marked the stamp of wartime impressions, it is natural that the artillery should have perhaps a paramount place in the French doctrine. They may do homage to the infantry, but their truer respect is for the artillery, which in their minds, if not in their words, is the decisive arm. It is cast, indeed, for a dual decisive rôle, for not only is the effectiveness of the fire of the "direct-support" artillery the condition which governs the possibility of the infantry assault, but it is by the concentrated use of a large artillery mass that the commander aims, in reality, to deliver

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the decisive blow. I trust to interpret correctly the underlying idea of the French if I say that this artillery mass is to be the modern form of Napoleon's Guard. While the divisional artillery are horse-drawn, there are some eighteen regiments of lorry-borne guns, each of thirty-six guns, and these would probably be used by the higher command as a strategic reserve which could be switched by road to the sector chosen for the decisive attack, there to overwhelm the resistance by its intensity of bombardment.

On the question of cavalry, the French have swung tactically from their pre-war theory to the other extreme. Before 1914 they emphasised shock action by cavalry masses more than any other army, whereas now mounted action is almost entirely discounted. The horse is regarded essentially as a means of movement, enabling rapid concentrations of dismounted fire-power to be made. Thus the French cavalry are virtually mounted infantry, or rather mounted automatic riflemen and machine gunners, for each regiment has thirty-two automatic rifles and eight machine guns. Even the name "cavalry" division is changed for that of "light" division, and its fire-power augmented by thirty-seven armoured cars, and a cyclist group with twelve machine guns. These light divisions form the "feelers" and tentacles of the octopus-like main army behind, as well as a mobile reserve during the battle.

What picture emerges from the doctrine which we have traced? That the French have created

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an army which forms a large and powerful, but slow-moving, steam-roller of fire which is designed to push back gradually, as in 1918, any similar army which is aligned against it. In basing their doctrine on 1918, the French have undoubtedly a sound historical justification. For, as they point out, their doctrine of 1875, after the Franco-German War, was far more true to the reality of 1914 than any of those which succeeded it, each tending to rely more and more upon man rather than upon his weapons, upon his courage and numbers, without sufficient care to safeguard these qualities against the rude shocks of battle.

But if 1914 proved again the truth of deductions drawn from the battlefield experience of 1870, we must also remember that the foe of 1914 had continued his organisation and methods on the same lines as in 1870.

What will happen if the foe of to-morrow, although the same in race, has entirely changed his "character"? Is not the structure of the French Army thereby undermined because it has been built on sands which have shifted instead of upon solid rock? The German Army of 1914 was an orthodox development on that of 1870, but to-day it is not only different in size but in ideas. Compelled by the Versailles Treaty to abandon the conscript "nation in arms" for a small professional array, the Germans have awakened to Marshal Saxe's dictum that "multitudes serve only to perplex and embarrass," and have replaced the ideal of

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quantity by that of quality. Mobility, manœuvre, and surprise are the keynotes of their new doctrine, recast by Von Seeckt, and they count upon the skilful handling of smaller forces of superior mobility and training to offset the deficiency of numbers. "Inferiority of numbers," we read, "must frequently be counterbalanced by greater mobility. . . . The use of railways, of motor transport, as well as the utilisation of darkness as a concealment for movements, will play a great rôle." To this we add the use of gas, a means which is discussed on almost every page of the German manuals.

How will the French steam-roller fare if its enemy declines to roll ponderously against it, and instead, barring large areas with gas, concentrates its highly trained forces for mobile thrusts aimed to dislocate the complex French war-machine? It is paradoxical that the French and Germans should have exchanged doctrines, in essence at least, the Germans embodying the Napoleonic tradition of mobility and surprise, while the French forsake their historic *élan* and swift manœuvres in their devotion to fire-power.

Viewing the French organisation in the light of their doctrine, we gain the impression of a machine in which the tremendous fire-power given by automatic weapons has been developed without adequate attention to its power of movement—like fitting a petrol-motor to an ox-wagon—and as such automatic weapons are

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essentially defensive, it is difficult to see this machine driving home an offensive punch against an evasive foe, whose small but mobile strength offers little target and facilitates counter-thrusts. Will the battlefields of to-morrow see another conflict between David and Goliath ?

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CHAPTER XVI

FRENCH ARMY TO-DAY

II. The Framework and the Forge

LAST autumn I was able, through the courtesy of the French military authorities, to visit some of the training-centres of their Army, thus renewing an acquaintance which has lasted over a number of years, and which was marked some years back by the honour of a request that I would furnish a critique of the doctrine in their post-war regulations. From the results of my observation and of friendly discussions with officers of all ranks, supplemented by my earlier experiences, I have sought in these chapters to sketch a picture of the French Army of to-day—its strength and weakness, its methods and its tendencies. Before passing on I wish to pay tribute to the courtesy and spontaneous kindness shown me throughout my tour; everywhere I encountered the utmost help and facilities, regardless of trouble to themselves, from commanders, staff and regimental officers alike. If for this reason alone, my visit was an inspiring experience in revealing the superficial effects of political discord, and their failure to disturb the good-feeling and comradeship in arms which have been cemented between the French and British Armies.

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As a necessary preliminary to any survey of the military strength of France, certain statistics are inevitable. But as numbers are always more a budgetary than a military means of comparison, it may be simpler to say that, whereas the pre-war forces of France comprised 10 cavalry divisions and 44 infantry divisions, they are now 5 light divisions and 32 infantry divisions, and a still further reduction to 20 is being carried out. If these divisions are stronger in fire-power than the pre-war divisions, so also are the forces of any possible enemy.

As there are some who regard the strength of the French forces as a menace to European peace, it is just to point out that, despite the colonial troubles of France, these figures represent a greater proportionate reduction than in our own Army compared with the pre-war strengths. Those who try to disparage these reductions by saying that it is more possible to reduce a large army than one which, like our own, has been pared down to danger-point, overlook the fact that the size of our Army is only calculated on the basis of an Empire police force. As the war proved, it is quite inadequate, until expanded, as a means of national defence.

The one real offset to this reduced strength is the addition of 130 air squadrons—1,850 machines, against 120 pre-war—and the exact value of this reinforcement is not calculable. At present the term of service is eighteen months in the active Army—shortly to be reduced to twelve—followed by two years in the first

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disponibilité, sixteen and a half years in the first reserve, and eight in the second reserve, which, in case of war, will be employed for local duties and the work of industrial mobilisation.

Let us turn now to the general organisation and distribution of the French Army. The higher direction is in the hands of the Minister of War, assisted by a body of senior generals, the Conseil Supérieur de la Guerre, of which Marshal Pétain is vice-president, and therefore generalissimo in case of war. But the lessons of the war, particularly the need to organise and be able to mobilise the whole resources of the nation, have led to the creation of a still higher advisory body, the Conseil Supérieur de la Défense Nationale, composed of Ministers, but with four advisory members—Marshal Pétain, Admiral Salaun, General Serrigny, who is Chief of the Council Secretariat, and a civilian, M. Paul Boncour, who presides over the Commission d'Etudes of the Council. As regards distribution, the troops on the Rhine form a separate army, at present of three army corps, and under the command of General Guillaumat, who earned the very special esteem of his British Allies during his brief tenure of the Salonika command in 1918, when he reorganised the forces, and prepared the plan for the September break-through which knocked Bulgaria out of the war. The command of the troops in France is exercised, under the Ministry of War, by the military governors of Paris, Metz, and Strasbourg, and the commanders of the nineteen regions into

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which the country is divided. The command of each region is coupled with that of an army corps of corresponding number, but the proportion of troops varies.

A French infantry division now comprises 3 infantry regiments (each of 3 battalions), a field artillery regiment (of 9 batteries or 36 guns), and a field howitzer regiment (of 6 batteries or 24 guns), both horse-drawn, a squadron of cavalry, and another of aircraft for reconnaissance, and a proportion of engineers and pioneers. Tanks, mechanical field artillery, and heavy artillery are army-corps troops. A light division, which has replaced the old cavalry division, comprises 6 cavalry regiments, 6 batteries of field artillery, a cyclist machine-gun group, and 37 armoured cars.

To give some idea of the proportions of the various arms one may mention that there are 195 battalions of infantry of the line and 30 battalions of light infantry, while the newer forms of mobile fire-power are represented by 44 battalions of light tanks, 2 battalions of heavy tanks, and 13 machine-gun battalions. It is a significant contrast that the French have only 50 per cent. more infantry battalions than our Army, but eleven times as many tank battalions. They also have 18 regiments of motorised field artillery—the guns carried in lorries, which constitute a powerful reserve of mobile fire-power. We have at present only the equivalent of one French regiment. The superiority of our machines cannot be said to offset such a vast

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numerical inferiority. Their colonial and native infantry include 18 battalions of Zouaves, 90 of North African rifles, 80 of Colonial infantry, and 90 of Senegalese and other native rifles. Of these some 50 native battalions are stationed in France. The French cavalry consists of 50 regiments, to which must be added 5 of Chasseurs d'Afrique, and 13 of Spahis, as well as 20 armoured-car squadrons. The main schools of the various arms are—for the cavalry, at Saumur; for the artillery, at Fontainebleau; for the engineers, at Versailles; for the tanks, at Versailles, with a practical course in their handling at Satory; for the air arm, at Versailles, with a practical course in flying at Villacoublay aerodrome. These schools may be termed the foundries in which is cast and patterned the military metal of France, and a few notes may give some impression of their scope. At the tank school, for example, the students fall into three categories—permanent officers who come for a ten-months' *cours d'application*, *enfants de troupe* (boys from the military schools) who have a thorough mechanical training spread over eighteen months, and reserve officers who, after six months in the ranks, come to the school for six months before passing on to spend the last six months of their service with a regiment.

Specimens of the war-time tanks of the different countries form a visual history of this new weapon, and the workshops are abundantly equipped with engines and mechanical parts, complete and sectional, for theoretical instruction as

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well as for practical engineering work. In one of the workshops I was particularly interested to see a new type of automatic revolving turret with a continuous series of tiny vertical slits all the way round. It was set in motion, and, stepping inside, one was able to see in any direction as if looking through a dusty pane of glass—the speed of motion making the slits become continuous and undivided to the eye. If still experimental, it impressed me as a most practical scientific solution of the blindness of the tank driver when fully shuttered in to avoid bullets or bullet-splash. For tactical and drill instruction one of the lecture-rooms contained a large model of country, covering the whole floor-space, with roads, woods, houses, enemy trenches, and wire entanglements. On this was set out a complete battalion of miniature tanks, with accompanying infantry and artillery to show the whole process of an attack from front to rear. On the walls a most lucid series of sketch-diagrams taught through the eye all the movements and formations of tank drill and action as well as the composition of units.

The aviation centre at Versailles is divided into four schools—air navigation, wireless, photography, and "technique," while there is also an instructor in the theory of air fighting and bombardment. In the photography section a significant register of progress is provided by the collection of air cameras from the earliest French and German types down to the latest automatic and semi-automatic cameras which

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take more than a hundred views. In the "technique" section the workshops and lecture-rooms were equipped with every possible model, specimen, and mechanical part, forming a complete visual record both of the development and construction of aircraft, and the facilities for a thorough training in air mechanics. My visit to the huge aerodrome at Villacoublay was equally interesting, the hangars full of machines, among which Breguets, famous for their long-distance flights, predominated. Among some of the impressions I gained were that metal construction is gaining ground here as elsewhere; that there is a general opinion of the value of the parachutes which were adopted and made compulsory about a year ago; that although the French have a great quantity of machines, the bulk are of old pattern and new types are scarce; that the supply and training of mechanics have given serious concern since the eighteen-months' service law came into force, and will become even more grave when this is reduced.

In a different category of schools come Saint-Cyr and the Polytechnique—the Sandhurst and Woolwich of France—for here are carried out the first stages in the formation of the leaders of the active army, on whose quality depends not merely the handling of the active army, but the possibility of expansion into an effectively trained nation in arms on mobilisation. The two schools offer a great contrast and a far wider divergence than between Sandhurst and Woolwich. Saint-Cyr I visited twice: first, on the

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occasion of the Prince of Wales's visit, which afforded a chance to see the ceremonial smartness of the cadets as private soldiers, and to breathe in something of the inspiring tradition which has permeated the Saint-Cyrien throughout the generations since Napoleon founded the school; second, a working-day visit which gave a more intimate view of the work and life of the cadets. The dormitories are as bare and comfortless as any barrack-room, the discipline strict, even severe, the class hours long and combined with a physical education so strenuous that no weakling could long endure it. Its aim is clearly to produce a spartan manhood, and the results are gloriously engraved in French history, for the boy who comes through the ordeal comes out also with a great tradition as part of his being, and the esprit de Saint-Cyr remains through life an influence which, in an army whose associations are more fluid, is the equivalent of our regimental spirit.

Saint-Cyr trains officers for the infantry and cavalry, whereas the Polytechnique is for the artillery, engineers, aviation, and technical services, as well as the Navy. The Polytechnique, however, is far more on the lines of a civil university, devoted to the education of the mind, where physical development and discipline are almost neglected. Yet the methods of a school which can produce a Foch, Joffre, Fayolle, and many others of the finest soldiers of France are not to be disparaged because they run counter to those practised at Woolwich and Sandhurst, and suggest that the emphasis upon

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disciplinary training for the budding officer can be exaggerated. Apart from a sprinkling of officers, the instructors are all civil professors, and the tradition that these should be chosen from among the ablest scholars and scientists of France is still maintained. Only three hours per week are given to military subjects, including drill and riding; and although it is incumbent upon all students to take a reserve, if not a regular, commission, the school trains students for many civil professions—engineering, public works, forestry, surveying, post, and telegraphs. Indeed, out of the annual entry or "promotion" of 225, the first 65 on the passing-out list have the choice of Civil Service posts, and as many go into private employment, so that less than a half go into the Army.

Further, the proportion of officers' sons is less than 20 per cent., in contrast to 50 per cent. at Saint-Cyr. But at both schools the whole cost of the education is borne in most cases by the State, not by the parents, which explains the overflowing supply of candidates even in these days, when the rates of officers' pay are no attraction to a military career. And if the Army does not get, except by chance, the intellectual pick of those who pass out from the Polytechnique, the fact that the entrance examination is recognised as the hardest in France, with that for the Ecole Normale, provides a guarantee that even the lowest on the list are highly educated and of a high standard of intelligence.

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CHAPTER XVII

FRENCH ARMY TO-DAY

III. Its Field Training

In an army where the men only serve eighteen months with the colours the problem of training is radically different from that of a long-service professional force, and the very handicap of so short a period has certain compensation, because it tends to a concentration on the essential elements of war training. The French scheme of instruction is governed by the two ideals of simplicity and economy of time, and from my observation appears to fulfil them to a notable degree in practice. Simplicity is sought both by restricting the instruction to the essentials necessary to make an effective combatant, and by giving it a form that the average recruit can quickly assimilate. This simplicity is an aid towards economy of time, the goal of which is to give the most thorough grounding in the knowledge and handling of weapons, battlefield formations, and simple fire-tactics—the three elements which, compounded, are sufficient to convert a levy of armed citizens into an army that on mobilisation can act effectively, while polishing off its roughness with experience.

In the infantry, for example, the young recruits are told off to the ordinary companies,

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where they undergo instruction in individual field work as riflemen, in close-order drill, and in the first elements of musketry. Towards the end of the first month a proportion are selected for the machine-gun company and infantry-gun section, while the rest begin their training as members of the normal infantry fire-unit, or *groupe de combat*, each man in turn filling the various rôles which the group comprehends. For it is a specialised body—even the rifle team, which comprises a corporal, a grenade-thrower and grenade-firer, and three riflemen-cum-grenadiers. At the same date the company commanders pick out the most promising recruits as probationer-corporals, who form a special platoon in the battalion. During the third month the company commander assigns each recruit to his permanent rôle as a member of the *groupe de combat*, so that after acquiring a general knowledge of all rôles his skill in his own assigned one can be developed. By the end of the fourth month it is reckoned that the recruit is "mobilisable." As the classes are called up in November and April, this means that the recruits are usually able to take part effectively in the annual training in camp, which is completed before the departure of the earlier class, whose time finishes in November.

A most excellent feature is that drill and elementary tactics are taught to the recruit simultaneously, and both are begun together at the start of his course. This is a common-sense remedy for the danger, from which we suffer,

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that the inevitable monotonous instruction on the barrack square may cramp the soldier's initiative and intelligence during the most vital period. First impressions are always the most abiding, and in battle the over-drilled instinct is apt to revert to the close-order drill movements of the parade-ground; perfectly dressed lines are easily converted into neat swathes of dead.

By the French duality of instruction the real purpose of the soldier is instilled, and his intelligence quickened at the outset by such elementary but highly practical tests as making him take up a fire-position facing in a given direction, then study the ground, and next use the cover it offers for an individual advance with the least exposure. The French appreciate that in the war the sense of dressing, or alignment, only led to casualties, and that a lack of a sense of direction marred countless attacks. The same practical outlook has led them to modernise their drill, basing it upon the battle movements and deployments of to-day instead of upon those of the Crimea—for the close-order drill of our Army, and that of the French in the past, is not, as some think, a set of exercises carefully designed to instil discipline, but is simply a survival of obsolete tactics which has lingered because made sacred by familiarity.

Although the development in firearms and the changed conditions of the battlefield had pointed the way since 1870, it was not until after the World War that we introduced officially a modern battle drill—for which I was responsible

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—and even so we have merely superimposed it on the other, a waste of training time and a confusion of the soldier's mind. The French, instead, have made their new battle drill serve as their close-order drill, with the simple adjustment of reducing the intervals and maintaining regularity. Each *groupe de combat* marches always in single file, and as the three groups of a "section" (Br., platoon) march side by side, the ordinary march formation is a "column of threes," from which the groups can shake out instantaneously, each following their own leader, if the column comes under fire. And in consequence the soldier absorbs a sense of direction all the time he is marching or drilling.

No one expects the same ornamental standard of drill from a short-service as from a professional army, but, from what I have seen, this simplified and modernised drill has also brought about better drill than in former days. The value of the practical system of intensive instruction in the French Army suffers some handicap from the way in which the bulk of the troops are dotted over the country in a series of small garrisons. The result is often a lack of adequate ground, for field training, within close reach of these small town barracks. The fact that there are troops stationed in nearly four hundred towns gives an idea of how widely they are distributed. But as a counter-balance, the units of each division are usually assembled for several weeks' training in one of the permanent camps—e.g. Camp de Mailly, Camp de Valdahon, Camp de la

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Courtrine, Camp de Coëtquidan. The training area is usually from five to nine miles long by two to four miles broad, and although this may seem small by comparison with the nominal areas over which the Aldershot or Salisbury Plain troops work on divisional training, it is entirely given over to the troops, and they can exercise without the perpetual handicap of avoiding private property, which is our own bugbear and cause of unreality.

Beginning with separate exercises by the different arms, the camp training works up to combined exercises by the division as a whole, with attached corps troops. A period of musketry and gunnery-range practices is included, often at the end of the camping time. Exercises are most methodically carried out, spread over daily stages of discussion and direct study of the ground, then carried out without troops, and lastly as the complete exercise with troops. As a result all ranks, and particularly the junior leaders, gain a thorough understanding of the subject. But as this deliberate method is allied with the rather stereotyped tactics of the 1918 pattern, it seems to produce excessive deliberation in executing the attack, which against a mobile and active enemy might result in the blow hitting the air, as well as giving him ample breathing-space to make a riposte.

A contributory factor towards these deliberate tactical methods may be that the French do not seem to be as fully equipped with wireless as we are, nor altogether satisfied with what they have.

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It was my impression that in practice they rely more on runners carrying messages than on any of the more complex means. The tanks especially seem to suffer from a lack of means of communication; whereas we have reached the point of wireless control within the section of four tanks, the French have only six wireless tanks to a whole regiment, and during operations the common practice is to take these away for the use of divisional headquarters. Again, radio-telephony appears to be still experimental, although in our Army it has been in constant use even for brigade exercises.

As regards the employment of weapons, one may summarise certain general impressions. In combined tank and infantry attacks the artillery are used to protect and support the infantry and their targets are mainly enemy machine guns, in contrast to our latest tendency, which is to rely on the tanks to deal with the machine guns and to use the artillery to protect the tanks. Although the French artillery strength is higher than ours, it is well below the 1918 proportion, and in the light of war experience I doubt whether at the start of another war it would be able to subdue the swarms of machine guns which a modern enemy would bring into the field.

Anti-tank and anti-aircraft fire and methods seem comparatively neglected, perhaps because the present German Army is forbidden the possession of these weapons under the Versailles Treaty. In the French infantry training the doctrine that fire-power is evalued in terms of

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the automatic weapon seems to be carried out in practice, and the rifle has become definitely a subsidiary weapon. In range-practices the standard of rifle-shooting expected is much lower than that of our Territorial Army. The bayonet is still fixed in attack, but essentially as a moral aperitif, and the sensible view is taken that except at night its use is obsolete, for to shoot even at a few yards' distance is more sure and less of a gamble than a hand-to-hand clash. The tactical employment of the automatic rifle and machine gun is extremely good in the French infantry, and they have developed to a high pitch the technique of creating a tidal wave of small-arm fire ahead of the advancing infantry.

If the French tanks are of an obsolete pattern, and their tactics narrowly circumscribed, they are individually handled with a skill and daring that compel admiration. As anyone who motors in France has come to know, the Frenchman is a born driver, and the audacity that adds terrors to the boulevards adds laurels when it is transplanted to the battlefields, mimic or real, of the *chars de combat*. When I visited Rennes Colonel Cabotte, commanding the 505th Regiment of Chars de Combat, was so courteous as to turn out several machines in order to show me their capabilities over a test course of obstacles. These Renault tanks are far smaller than the Vickers, our own standard machine, and hardly larger than the Martel one-man tankette in bulk, although their weight is more than double. This is partly due to their thicker armour, for, whereas

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ours have only 8 mm., the vertical plates and turrets of the Renaults have 16 mm., and the latest pattern turrets 22 mm. The crew numbers two: the *chef de char*, who stands in a revolving turret, directs the driver, and fires the gun or machine gun; the driver, who sits in front on the floor, and shuts himself in by folding flaps, which give the machine an amusing resemblance to an old-fashioned Turkish-bath cabinet.

To eyes accustomed to the fast Vickers or Martel machines, the Renault appears a mechanical tortoise, for it moves at walking-pace, its road speed being only about four miles per hour, and less across country. But, in compensation, it can surmount formidable obstacles in a way which surprises the onlooker. With the extra span given by its attachable tail it crossed trenches over 6 feet wide. The most impressive performance, however, was the crossing of a high razor-backed mound with a slope of more than one in two, and with a surface liquefied into mud by heavy rain. On reaching the crest the front of the machine rose higher and higher off the ground, until three-quarters of its length was hovering precariously in the air, and it seemed that the tank must either turn turtle backwards or come down on the steep forward slope with such a bump that it would turn a somersault. Instead, so skilfully was it handled that the front came down and touched the bank as lightly as a feather. The battalion commander, who had been in Morocco, told me that the tanks had gone up mountain-sides, and with such drivers I could

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well believe it. Somersaults were fairly frequent, but the sturdy build of the machines survived such mishaps, and he had seen one machine fall 20 feet sheer and only damage its tail, the crew unhurt. It is a tribute to the Frenchman's mechanical instinct and adaptability that although the tank personnel are not specially picked—those I saw were mainly farm hands—they become efficient drivers after three months' training.

Competition is a feature of the French training, and the training of the artillery usually concludes with a *concours de tir*, while that of the tank regiments finishes with a *concours des mécaniciens*, which I witnessed. It began with a *cours de pied*, the crews running on foot from the barracks to the exercise-ground, then starting up their machines, and doing a two-kilometre timed course over and round a series of obstacles, and finally dismounting and firing a machine-gun practice on an indoor range, about 100 yards long, at a life-size target to represent a machine gunner. The best score was twenty hits out of ninety-six rounds, which gave great satisfaction, as also did the fact that all the tanks came through the course without breakdown. As regards the 32-mm. gun, with which three out of the five tanks in a section are armed, I gathered that this is only expected to fire at ranges of 50–100 yards, whereas at our tank gunnery school at Lulworth the tanks, themselves travelling at speed, score hits on a moving target at 500 yards.

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CHAPTER XVIII

FRENCH ARMY TO-DAY

IV. Its Future—Mobile or Militia

HAVING pictured the French Army as it is to-day in body, thought, and training, can we gaze into the crystal and foretell its future? We have seen it as an army strong in numbers, if less than before the war, and stronger still in fire-power. It has fulfilled its own axiom that "fire is the preponderant element" by assuring its own preponderance in fire-power over any other army. But has it taken any effective steps to ensure that the advance in the means of movement and of protection keep pace? It has forty-four battalions of light tanks, and two of heavy tanks to our four. But although the French have nearly 3,000 machines, they are all of war-time pattern, their speed no faster than the man on foot, and their very imperfections have tended to narrow the French military horizon.

Similarly, the French have eighteen regiments of *artillerie portée*, 650 "motorised" field guns, but these guns are carried in old Quad and Panhard lorries, and their capacity to move off the road and across country is very limited. One must not underrate their strategical mobility, for a day's march of sixty miles is reckoned on, and during the war they covered occasionally as

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much as 100 miles. On the other hand, their tactical mobility is low, and in any case the advantage of a mobile artillery is depreciated if the striking part of the army is immobile.

If the present equipment of the French Army is obsolescent, are there new designs available? Research has not been neglected, and the great Saint-Chamond firm, especially, has produced a quantity and variety of experimental machines which are a tribute alike to their energy and to their manufacturing resources. It is significant that their artillery designer is Lieut.-Colonel Rimailho, whose name is associated with the famous 75-mm. gun and other developments in ordnance design. The outstanding feature of all the Saint-Chamond experiments is the combination of wheels and tracks in this one machine, in order to blend the speed and economy which the wheeled machine possesses on roads with the cross-country and obstacle-crossing power of the tracked machine.

They have been producing since 1921 the wheel-cum-track types which have only recently been the direction of research in this country. Their first machine was a light machine-gun tank, the Chenilette Saint-Chamond, which has a 15-h.p. motor, weighs 3 tons, has a crew of 2, and a normal speed of 12 m.p.h. on wheels and 3 m.p.h. on tracks. A variation of this was an infantry tractor which could carry an infantry *équipe* of 6 men and tow an ammunition-trailer. This was followed by a larger chassis with a 40-h.p. motor, which could be adapted for use as a light artillery

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tractor, a motor mounting for a 75-mm. close-support gun, a light gun-tank armed with a 45-mm. gun, and a tank similar in design but armed with two machine guns. The weight of the tank is 8½ tons, and of the unladen tractor just under 5 tons. The normal speed of the tank is 9 m.p.h. on wheels and 3 m.p.h. on tracks, rising at 2,000 r.p.m. to 13 and 5 m.p.h. respectively. Beside this chassis, still larger ones have been designed for corps and army artillery tractors and for lorry tractors.

But when we compare the speed of these machines with that of our own standard Vickers tanks, which can travel 20 to 25 miles per hour on tracks, and with our later types, it becomes clear that these experiments have raised the French level of mobility but little above that of their present equipment—and against modern fire mobility means security.

From the machines we pass to the men. The doctrine and organisation of the French Army cannot fail to influence the subject of man-power, while the method of recruitment in turn reacts upon the functioning of the army in a future war. As is well known, the term of service is to be reduced from eighteen to twelve months, and as this far-reaching change must have a profound influence on national security it has led to a thorough reorganisation scheme. The provisions of the scheme may be briefly summarised. The home and overseas forces will in future be distinct, and the Colonial Army will number 277,000, of which 97,000 will be white troops. White units

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attached to provisional active-service formations and the white cadres of all native regiments will be composed entirely of re-engaged men or volunteers. At home the present thirty-two divisions are to be reduced to twenty, and in order to ensure the maximum of training during the reduced period of service the police, office and barrack duties are to be carried out by engaging 14,000 civilian employees and 15,000 special *agents militaires* for work in the new *Centres de Mobilisation*. In addition 29,000 re-engaged N.C.O.s and men are wanted to strengthen the instructional cadres, raising the personnel of these to 105,000. It is intended to call up all the recruits of a battalion together, and to keep them together during their service under the same leaders, active and reserve. Further, it is intended to return to the twenty-one years age rule for recruits, and during the transition period 1926–29 the age of each contingent will be gradually raised.

From these details it is clear that success in laying the foundations even of the new scheme depends on obtaining the 58,000 re-engagements and civilians, and the prospect does not seem very hopeful unless the pay is raised and conditions of service made more attractive. Money, indeed, is the rock on which not only the new scheme, but the military strength of France, may founder. The pay of the officers is deplorably low, inadequate even for bare existence, and the rise granted early in 1926 was far too small to counteract the vast increase in the cost of

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living and depreciation of the franc. A captain receives only 1,500 f. a month, a commandant 2,000—the rough equivalent of £140 and £180 a year respectively. Unlike our own Army, few of the officers outside the cavalry have any private means at all, and the natural consequence is that they are reduced to living under conditions which a British working-man would reject. I have heard of whole families living in a couple of rooms in a back street, and of officers who could hardly carry on their duties for want of sufficient food. Such conditions would demoralise the finest army, and if there are now signs of this ill-effect, the one cause for surprise is that self-sacrificing devotion and esprit de corps could have checked it so long. The tenacity of spirit of the French officers under such conditions is almost as heroic as their conduct in the war.

But its evil effect must be even more in the future than in the present. The senior officers, men of fine stamp, are too old to change their profession, even if their spirit permitted; but their quality is not being replaced. Junior officers of a sort will still come in, because education at the military colleges is free, and because there is still a social prestige in being an officer which attracts classes who formerly could not aspire to it. But unless France entirely remodels her army and its conditions, I fear for her real security when this fine type of present senior officer has died out.

Her doctrine of fire-power and complex tactical

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organisation of the 1918 pattern are themselves handicapped by the difficulty of obtaining efficient and sufficiently numerous instructors, which in turn reacts upon the shortened period of service. The more technical arms are already suffering because eighteen months is found so short for such training, and the reduction to a year makes the situation more ominous. It is little use building a doctrine of war upon the overwhelming effects of an intricate production of fire, if one cannot rely upon this fire for hitting its target. Inadequate training must cause still more friction in a war machine which, as my earlier remarks have suggested, has developed its fire-power without equal attention to its protected mobility. Under the test of a future war the ponderous advance of such a machine might break down altogether.

A further factor is that, if gas plays the prominent part in the future which war experience and reason predict, the weakness of French chemical resources and industry compared with its neighbour forms a grave handicap, and one accentuated by her trust in gas-exposed arms like infantry and cavalry.

The one element which may modify the conclusions we have drawn is the French air arm, the strongest in the world—although here again quantity is obtained partly at the expense of new equipment. It may be even true that in the French air arm rests almost entirely the effective power of the French Army to press an offensive and impose its will on the enemy, otherwise made

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secure by the defensive preponderance of land armaments to-day.

To sum up the situation as a whole—I feel that France militarily stands at the parting of the ways. If she continues on her present course, her Army will become a national militia, growing ever less effective owing to lack of modern equipment and lack of expert instructors, as her old type of professional officers, devoted and highly educated, drop out from lack of adequate pay and prospects.

What is the alternative course? My own conviction is that a smaller professional army, well paid, highly trained and mechanised, would by its quality give France more real security than her present quantity affords. I would go farther, and say that far from being a militarist menace, as is the delusion of ignorant foreign pacifists, France to-day has hardly adequate cover in her military insurance policy, and this security is shrinking to danger-point. The situation is serious because a secure and strong France is essential to the stability of European peace.

I know well that the suggestion of changing to a professional army has little hope of acceptance in France, where the fear of a military dictatorship is a political obsession, and where the belief that a conscript army is necessarily a cheap military insurance has a deeply rooted hold on the public mind.

But France has been such a pioneer in mechanical development, and mechanisation has such

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obvious advantages and so few drawbacks for a country whose military problem is primarily European, that she will surely awaken to the fact that here lies the science-sent means to offset her declining population and to buttress her military position by a revival in modern form of that mobility which has been her tradition and her spirit. For in the mobility of her forces she found of old the secret of her greatest successes, and it is essentially suited to the temperament of her people.

Thus, even if her Government shrink from a complete change, it may be that, realising the precipice to which the present path is trending, they will seek a compromise solution, and cut down mere quantity in order to afford the cost of converting part of their present forces into a mechanical striking force of highly trained long-service volunteers, to form a spearhead to the national Army, which could be expanded and developed after the outbreak of war.

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PART IV

RETROSPECT

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CHAPTER XIX

THE ORIGINS OF THE TANK

THE real origins of the tank formed a question widely debated during and immediately after the war, a question that was popularly, if incorrectly, epitomised in the words, "Who invented the tank?" So many claimed the honour, many with some show of reason, and still more without, that the public mind became confused. Nor can it be said that the Government made much effort to establish the actual chain of causation, perhaps swayed by the instinct of the Treasury to avoid possible financial obligations. More worthy of our national dignity, if, unhappily, not of our past traditions, was the popular desire to award credit to those who "deserved well of the State." This wish was rooted in the general recognition that the tank had been a decisive factor in crowning our arms with victory. With the post-war years this popular view has been strengthened and confirmed by the admissions of our late enemies. Was it not Ludendorff himself who spoke of the great tank surprise of August 8, 1918, as "the black day of the German Army in the history of the war," and added "mass attacks by tanks . . . remained hereafter our most dangerous enemies"? More emphatic still is the comment of General von Zwehl: "It was not the genius of Marshal Foch

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that beat us, but 'General Tank.'" Nor can it be suggested that these were after-thoughts put forward in mitigation of defeat, for the most striking evidence of all, red-hot from the forge of battle, is to be found in the momentous report submitted, on October 2, 1918, by the representatives of the German Military Headquarters to the leaders of the Reichstag: "The Chief Army Command has been compelled to take a terribly grave decision and declare that according to human possibilities there is no longer any prospect of forcing peace on the enemy. Above all, two facts have been decisive for this issue: first, the tanks. . . ." The confession thus made gains force from comparison with the earlier disparagement of the tanks by the German Command.

Much of the confusion regarding the early history of the tank has arisen through the lack of any clear definition of what a tank is, and this vagueness owes something to the fact that prior to the time when the camouflage name "tank" was invented, the machine was known as a "landship" or "land-cruiser." Such a title, due to its being mothered in infancy by the Admiralty, however prophetic of its still distant future, is far from applicable to its past, in the war. Regarded as a landship, or even as an armoured battle-car, the origin of the tank is lost in the mists of antiquity. Among its forbears might be included the ancient war-chariot, the Hussite war-carts which formed their famous *wagenburg*, even, with some show of reason, the battle-

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elephants of Pyrrhus, or the mediæval knight in armour. If the search be limited to self-moving, as distinct from men- or animal-moved machines, its origin might be traced to Valturio's wind-propelled war-chariot of 1472, or to that many-sided genius, Leonardo da Vinci. In 1599 Simon Stevin constructed for the Prince of Orange two actual landships, wheel-borne and sail-propelled, and as far back as 1634 David Ramsey took out the earliest patent for a self-moving car capable of use in war. So through an endless chain of experiments the origin might be traced. The caterpillar track itself—perhaps, in general opinion, the distinctive feature of the tank—goes back to the early nineteenth century, and if the definition be drawn still closer to mean a petrol-driven tracked machine for military use, the Hornsby or the Holt tractor of nearly twenty years ago can claim the parentage of the tank. If the use of such machines as weapons be the test, then H. G. Wells has priority of conception; if similarity of design, then one recalls Mr. de Mole's model, superior to the 1916 tank, which was pigeon-holed in the War Office in 1912. To these add also the story of the Nottingham plumber whose hobby it was to make toy machines of this nature and whose design, submitted to the War Office in 1911, and duly pigeon-holed, was unearthed after the war, the file bearing the terse official comment, "The man's mad."

Such an historical survey convinces us of the futility of trying to determine the credit for the

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origination of this decisive weapon of the World War without a clear understanding and definition of its particular purpose. Leonardo da Vinci and the Nottingham plumber alike may claim to be among the fathers of mechanical warfare, but for the parentage of the actual tank of the World War we must look closer. The test of its origin is tactical rather than technical. It was a specific antidote for a specific disease which first broke out virulently in the World War. This disease was the complete paralysis of the offensive brought about by the defensive power of serried machine guns, and aggravated by wire entanglements. The disease doomed the manhood of the nation to a slow and lingering death, the end prolonged only by the capacity of the country, or the Empire, to produce men for the futile sacrifice. Wycherley's phrase, "Necessity, mother of invention," has never had a truer example, and it yields us the essential clue to determine the origin of the World War tank. The evidence marshalled in reply to an action brought against the Crown in 1925, supplementing that of the Royal Commission on Awards to Inventors, served to show that the first military physician who diagnosed the disease, and conceived the antidote, was General Swinton. As official historian of the Russo-Japanese War he had grasped the tendencies of modern warfare, the dominating rôle likely to be played by the machine gun, and, later, had taken an active interest in the earlier caterpillar tractors. Then, as official "Eyewitness"

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at General Headquarters in the early months of the war, he was in an exceptional position to diagnose the new conditions that had arisen. His previous experience and reflection gave him the source from which to seek the antidote, and his suggestions to Sir Maurice Hankey, on October 20, 1914, became the first link in the causation of the machine gun and wire destroyer, afterwards christened the tank. But without the "receptivity, courage, and driving force of Mr. Winston Churchill," to use the fitting words of the 1919 Commissioners, it is unlikely that the remedy would have been compounded or applied. Even so, progress was slow, and experiments for a time were misdirected or uncertain. General Swinton came on the scene again to formulate the tactical ingredients for the remedy, and, with this definite knowledge of requirements, Sir William Tritton and Major Wilson were the chemists who compounded the drug which cured the paralysis that had crippled and brought to naught our military efforts. This antidote took form in "Big Willie" or "Mother," the original of the tanks which made their first appearance on the battlefield on September 15, 1916. No praise can be too high for these two men, whose mechanical genius created a practical machine; but priority both in time and importance goes to those pioneers whose imagination and energy were responsible for the origination and adoption of this mechanical saviour of the nation's manhood. Many others contributed a valuable share; but the names of Mr. Churchill

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and General Swinton stand out, rightly, pre-eminent in the chain of causation.

The diagram facing this page aims to disentangle the main as distinct from the subsidiary links in this chain and to trace the decisive influences which led to the production of "Mother." In establishing such a chain the first and dominating essential is to be clear as to the real purpose of the original tanks. In these post-war days the improvements in design, and especially in speed, in conjunction with widespread study of the trend of warfare, have led to a development of the original conception, and to-day military opinion is coming to regard tanks as the modern successor of cavalry, the heir of cavalry's historical rôle. Looking still further into the future, we sense the coming of tank armies, which shall have swallowed all the traditional arms of the service.

But in its early years the tank was fundamentally an antidote to machine guns, a means of restoring to the offensive the power to combat the superiority with which the mass growth of these weapons had endowed the defence. Thus the acid test of the links in this chain is whether they were based on the conception of a bullet-proof trench-crossing machine-gun destroyer.

Following this test the first definite link stands to the credit of Colonel (now Major-General Sir Ernest) Swinton, who on October 20 went back from France, saw Colonel (now Sir Maurice) Hankey, Secretary of the Committee of Imperial Defence, and, after describing the situation—the

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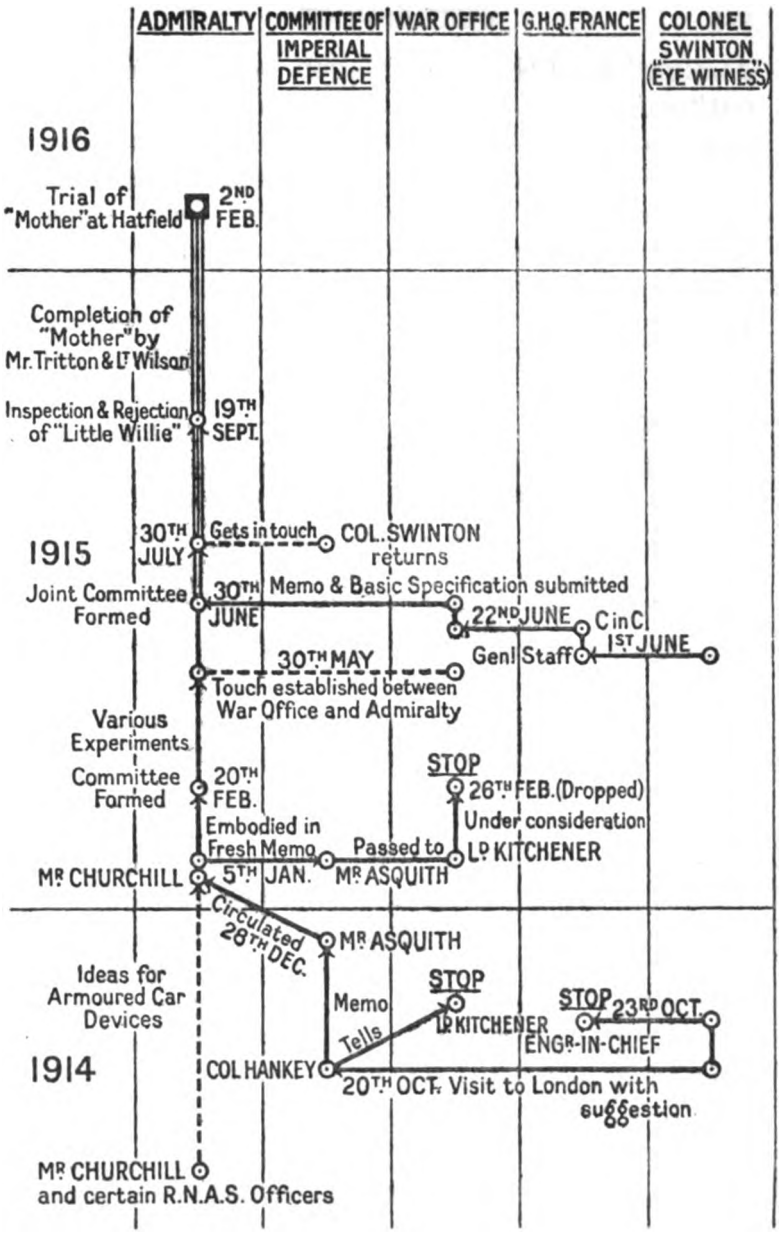

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domination of the machine-gun based defence—outlined his proposals for an antidote. These were, in brief, to develop an existing machine, the Holt tractor, into such a trench-crossing machine-gun destroyer, armed with one or more small quick-firing guns. A further discussion the next day led to an understanding that Colonel Hankey would take up the matter at home and Colonel Swinton in France, where he was the official "Eyewitness." On October 23 Colonel Swinton took up the question with the Engineer-in-Chief, but this channel led to no result.

Meanwhile Colonel Hankey put the idea before Lord Kitchener, with equally barren result. He also submitted to the Prime Minister (Mr. Asquith), as head of the C.I.D., a memorandum on various forms of attack, which embodied, among others, Colonel Swinton's suggestion. This reached Mr. Churchill, as a member of the C.I.D. His mind was already active with the problem of enabling armoured cars to cross broken ground and trenches, because of his concern with the R.N.A.S. armoured-car detachments on the Belgian coast. On January 5, 1915, he wrote a letter to the Prime Minister, on Colonel Hankey's memorandum, and more particularly on that part which had sprung from Colonel Swinton's suggestion. This letter was sent by Mr. Asquith to Lord Kitchener. By a coincidence Colonel Swinton had called at the War Office on January 4 to discuss his proposals, now extended owing to the continued experience of conditions in France, with General

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Scott-Moncrieff, Director of Fortifications and Works.

The seed thus planted at the War Office from two sowers fell on stony soil, and after some attention finally languished. Fortunately, the general idea was kept alive on other soil, for Mr. Churchill in February formed a committee at the Admiralty, which later became known as the Landships Committee. But this committee, though investigating many lines of thought and experiment, did not make much practical headway, its energies being diverted for a time in the direction of a landship with giant wheels. A worse blow was the removal of Mr. Churchill's vision and driving force, though even when he left the Admiralty it was his influence which kept the experiments alive. By this time, also fortunately, the committee, under Sir Tennyson D'Eyncourt, had got back on to the right line —that of the caterpillar. Even so, concrete results seem to have been hindered, and energy leaking, through lack of any exact specifications of the military requirements of such a machine, for in the scheme of scientific war the tactical takes precedence of the technical.

This essential but hitherto missing link came in a memorandum from G.H.Q. via the War Office on June 30, and once this was available, rapid and practical progress ensued. The origins of this require explanation. Late in May Major Glyn, M.P., visiting France as an unofficial liaison officer between the War Office and G.H.Q., told Colonel Swinton of the Admiralty experi-

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ments, which were unknown to the War Office. Discussion between them led to Major Glyn broaching the matter to General Callwell, Director of Military Operations, who took it up and got into touch with the Admiralty Committee, leading on June 30 to a Joint Committee being formed. In the meantime Colonel Swinton decided to take his proposals to the fountain-head, Sir John French, and the eventual result was that on June 22 G.H.Q. forwarded a memorandum containing specifications of the performance required of the machine, compiled by Colonel Swinton, to the War Office, and on this specification the joint committee got to work.

On July 19 Colonel Swinton returned to England as Secretary to the War Committee of the Cabinet, and got into touch with the Joint Committee, later, on the Prime Minister's authorisation, calling an Inter-Departmental Conference to co-ordinate the work on the new machines. On September 19 an inspection was held at Lincoln of a provisional machine, " Little Willie," but this was rejected by Colonel Swinton as failing to conform to the War Office requirements. He was then shown a full-size wooden model, or " mock-up " of a larger machine, which had been specially designed by Mr. Tritton and Lieutenant Wilson to met the latest Army specifications. This was accepted, as it looked able to comply with the two main conditions—to climb a vertical face of 5 feet and cross a ditch 8 feet wide—and it was decided to concentrate on the production of a sample machine of this type.

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Finally, on February 2, 1916, at Hatfield was held the official trial of this machine—christened "Mother" or "Big Willie," and as a result 150 of these machines were ordered, and on September 15 these tanks went into action for the first time.

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CHAPTER XX

IN PICARDY—TEN YEARS AFTER

WHEN the rekindling of old memories is combined with the gathering of fresh information on historic events, and translated into positive lessons from the past for the future, a tour of the battlefields gains an interest and value that are not merely passing, but permanent. The opportunity came to me to make such a visit to Picardy and Artois with the Aldershot Command Staff Tour, under Lieut.-General Sir Archibald Montgomery, who was Chief of Staff of the Fourth Army during the eventful years 1916–18, and since the war, until his promotion, Commander of the 1st Division, the spearhead of our new Expeditionary Force. While these "educational" tours are now fairly common, this was one of the most important, both in scale and scope, and its value increased not only by the intimate connection of its director with the actions studied, but by the presence of many other officers who played an active rôle in the battles. As the years pass, memories fade, and even in those actual years of war were blurred by the rush of incident and the constant changes of scene. But when once more on familiar ground, with time for meditation undisturbed by the cares of command or by shells, the imagination and the memory respond to the environ-

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ment, and the pictures of the past take a clear and definite form.

What is the military value of such tours, and of this one in particular, where the battles studied are those of 1914 and 1918? First, they give a sense of reality inevitably lacking in the staff and troop exercises of peace-time training at home. The student analyses not what might be done in a hypothetical case under hypothetical conditions and with an enemy who is a pawn of his own imagination, but what men actually have done. And although invention may modify the weapons and equipment, human nature does not change—or at most only with infinite slowness. If we accept Napoleon's famous dictum that "moral force is to the physical as three to one" as an axiom, regarding it as a fundamental truth rather than an arithmetical proportion, the value is manifest of studying the reaction of the human element to real conditions.

We have now available the records and impressions of the enemy to complete the picture, a source perhaps more vital than any other. For the most progressive military thought, following in the footsteps of the Great Captains, conceives the real target in war to be the mind of the enemy command, not the bodies of his troops. If we operate against his troops it is fundamentally for the effect that action will produce on the mind and will of the commander; indeed, the trend of warfare and the development of new weapons —aircraft and tanks—promise to give us increased and more direct opportunities of striking at this

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psychological target. It was one of the outstanding merits of this tour that General Montgomery traced throughout, with abundant data, the reaction of events on the German Supreme and Army Commands, as revealed in their orders and messages. At the same time, by many an illuminating anecdote, he showed how the psychology of the different leaders influenced the British and Allied operations, how the interplay of temperaments and impressions worked and what they produced, how in the relation of cause and effect "great oaks from little acorns grew." In a word, here was history, its warp and woof, not merely a chronicle of superficial facts.

The value of such a tour, however, is not limited to the psychological, but extends to the physical sphere of war. The choice of 1918 episodes for study is justified by historical experience, for every modern war has shown that the tactics evolved by the end of a campaign foreshadowed those of the next and recognised the effect of fire better than any in the interval. For the methods in use have been hammered out of the molten ore of battle experience. While the lessons of a war are still fresh in the minds of the actual combatants, the deductions are likely to be more true to reality than those subsequently culled in the years of peace from the artificial experience of the training-ground and the academic discussions of the staff. For example, the first tactical doctrines formulated by the French after the 1870 war bear an astonishingly close resemblance to those practised in 1918, whereas

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the doctrines of 1914 appear ludicrously incompatible with the nature of modern war. Provided that we make due allowance for the more abrupt fluctuations of *moral* which marked the last year, unquestioned benefit is promised by such a contemporary study, on the battlefield, of what men actually achieved, and of the method by which they came to success.

If the reconstruction of these battles, and their lessons, requires a book complete in itself—which was my personal object in taking part—the tour had a variety of local colour and historical sidelights which may endow an account with some interest for the general reader. Many fought over these battlefields who have not seen them since, many unhappily have a more enduring link with some hallowed patch of Picardy soil; for all in England those downlands were once a focus of interest. To summarise the results of observation as to the present condition of the battlefields is not my intention, but instead to touch on these impressions during the narrative, for such impressions come like butterflies flitting over the fields of memory.

An advance party of four travelled to France a day before the remainder. The journey out was signalised by only one event—the feat of a member who showed his superiority to inferior sailors by eating a good English lunch on the boat and an equally good French one in the Calais buffet in company with his more timorous companions.

The endless halts on our journey to Amiens

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conduced to a reminiscent mood, where every station awaked memories of the past. Abbéville, sunk back from activity to slumber, where once miles of sidings marked perhaps the best-known of British rail-centres. Pont-Remi—site of a musketry school established when the British soldier in his devotion to the new love, the bomb, had forgotten the traditions of 1914, forgotten that a rifle was intended to shoot with, not merely to serve as an inferior pike. Longpré, sacred to the memory of many who fought to the last drop of ink on battlefields of foolscap. Picquigny, famous in history and famous, or famished, in the writer's history—the scene of the best and most appreciated meal in his life, when returning from the four opening days of the Somme offensive, of little sleep and less food. Here, crawling into a wayside café, he consumed two omelettes *pour deux*—the French village idea of an omelette *pour deux* is on a somewhat larger scale than that of a town restaurant—a yard measure of new bread, two vast bowls of *café au lait*, and two quarts of beer to cap the Lucullan feast. Heavens! what joy to one suffering real pains of hunger—a nasty sensation even in retrospect. But what agony afterwards! If these reminiscences seem to trend overmuch towards repasts, the excuse, unnecessary to soldier readers, must be that in those years food bulked as largely in the individual's outlook as it did in the strategical.

On our arrival at Amiens we were met by Captain Gregson, who was arranging the transport

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of the tour, and whose presence was yet another link with the past. For this former officer, now familiar to hundreds who have profited by his aid in visiting the battlefields, is one of many who after demobilisation stayed to seek their fortune in peace where they had served in the war. As the stream of battlefield visitors has shrunk, his service of cars has extended its range, to carry out journeys through any part of France. It is curious how many Englishmen have so settled in France. In Amiens one café is owned by a former sergeant, another by an Australian soldier. Still more romantic was a case discovered in a village near Le Cateau, where, far behind the German lines, a soldier who escaped capture was concealed throughout the war, subsequently to marry the daughter of the house. It is rumoured, however, that his mother-in-law considers that there is a sad difference between English and French ideas of a normal working day.

Strange how history repeats itself, for in the village of Saint-Souplet, also near Le Cateau, I discovered that the proprietor of a little café was the grandson of a soldier from Manchester, Clough by name, who had fought at Waterloo, and afterwards settled in France. This man had stayed in his home when the German tide poured through the village in August 1914, and remained there until driven out by the British bombardment preparatory to the crossing of the Selle in October 1918. Then he had gone to Avesnes, to welcome the advancing British

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twenty minutes after the Germans had retired from the town. He told me that the German occupation was hard during the first few weeks, but that from the Battle of the Marne onwards their regime had been mild.

But we are anticipating the narrative. On the first morning after arrival we set out by car on a preliminary survey of the ground south of the Somme, over which the Fourth Army advanced on August 8, 1918, stopping for a sandwich lunch beside the German 17-inch gun, in Arcy Woods, which was brought up to bombard Amiens. Fortunately, its destructive mission had hardly begun before it was interrupted by the British attack, and it was blown up by its crew, the breech-block being discovered a quarter of a mile away. But though put out of action, it was not destroyed, and remains an impressive memorial of the past. An altogether superfluous notice gives warning that visitors are forbidden to take away the gun. As the mounting is built into a sunken iron and concrete emplacement some 50 feet across, and the muzzle is wide enough for a slim man to crawl into, it would be interesting to see a souvenir-hunter make the attempt.

Thereafter we crossed at Bray to the north bank of the Somme, and traversed the battlefields of 1916. Four years ago these still remained a wilderness—unlike the less shell-torn ground farther south—with "dud" shells, German stick-grenades, and other relics of the past lying about or protruding from the soil.

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Trenches, it is true, were filled in, but the fresh chalk clearly showed their trace, and the surface of the country bore that air of nude desolation peculiar to ground which has been ploughed by high explosive. Now that the land has returned to peaceful normality, the rolling downs are covered with green fields of corn or pastures, distinguished only by the luxuriance of their growth. The sight provokes reflection on nature's swift power of erasing the scars of war, on the magic of agriculture as the great healer. The contrast was enhanced by the manner of our approach—gliding gently, on a quiet country road, round the southern edge of Trones Wood, to come in sight of the new village of Guillemont. Down a slight slope, up another, only a few hundred yards of rural lane now, yet in July and August 1916 what an infinite distance! Division after division essayed to cross it, felt the prize within their fingers, and then slipped back unable to maintain their hold. The contrast of ten years was almost beyond imagination to comprehend—its only link Guillemont Road Cemetery in the dip, beautiful symbol of the sacrificial price. The impression left by these war-cemeteries is ineffaceable, worthy of the sacrifice they commemorate. No praise can be too high for the exquisite taste and sense of beauty which inspired their design. Surrounded by a low wall, the perfectly ordered rows of headstones, delimited by grassy paths, frame the two central monuments—the slender and lofty "cross of sacrifice" bearing a crusader's

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sword in bronze, the great altar-like "stone of remembrance," a symphony of shimmering white and restful green, toned by a cluster of mauve flowers at the foot of each headstone, on which is carved the regimental badge above the name, and a cross below.

Passing on through Guillemont and Ginchy we came to Delville Wood, of undying remembrance, where a unique South African memorial was being finished. All these woods of the battle-zone attract the eye by a common peculiarity. The shell-riven poles of the remaining trees stand out gaunt and bare above the luxuriant foliage of a dense expanse of bush, some 8 or 10 feet high. Each wood has become an impenetrable thicket, without rides or tracks. It is interesting to speculate on the area of France which is thus denied to the passage of man, and on how long this condition will remain. But through Delville Wood a wide tract has been cleared to form a greensward park leading up to the white arc-shaped colonnade of the memorial itself.

Thence we drove on to High Wood, so nearly gained on July 14, 1916, and then to defy our efforts until September. Never in the actual struggle had one so fully realised how this ridge commanded and dominated the country between the Somme and the Ancre. Looking west from High Wood the vision travelled far behind the "old front line" of July 1. What a faculty the Germans had for establishing their line on the high ground, and what an

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advantage it proved during the ensuing years of trench warfare! The view also aroused reflection on the doubtful wisdom of our Higher Command, when they had once gained this ridge, in pushing their way, at disproportionate cost, down the farther slopes—whereby no further profit was gained, and the troops had to spend the winter in waterlogged trenches and clinging mud. From High Wood we passed by Bazentin le Petit and Pozières to Thiepval, the one village which has not been rebuilt and the one stretch of ground not yet cleared. Here portions of the old German trenches remained, and here recently a belated mine exploded, close to a British cemetery. From accounts we gleaned an impression of the hazards faced by the French peasantry, returning to rebuild their homes and retill their land, and of the casualty roll that has been involved.

At Thiepval also is the Ulster memorial, a replica of St. Helen's Tower, and from its summit the greater part of the 1916 battlefields could be compassed by the eye. So past St. Pierre Divion, Hamel, and Aveluy to Albert. The town is now nearly restored, except for its cathedral, more picturesque as a ruin than when it stood intact, save for the leaning Virgin.

Our return to Amiens was made in time to greet the remainder of the party—forty in all—which, besides numerous battalion and artillery brigade commanders from the Aldershot Command, included the Adjutant-General in India, Lieut.-General Sir John Shea.

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Next morning, in a convoy of cars and charabancs, we set out first for Moreuil Wood, near the Luce, where on March 30, 1918, the 2nd Cavalry Division came up to help in stemming the German tide which was sweeping towards Amiens and threatening to separate the British and French Armies. Our exhausted infantry had fallen back from the wood, and the situation was critical when General Seely's Canadian Cavalry Brigade, supported by the 3rd Cavalry Brigade, attacked so promptly as to recapture the position before the Germans had consolidated their hold.

To study the action on the ground was to have an object-lesson in the value of rapid decision. With his headquarters in the van General Seely sized up the situation, and within a few minutes the leading regiment was committed to the attack. Tactical faults there may have been, and intermixture of units, but the value of such instant decision is incalculable, the divine spark in cavalry leading. This operation is notable, also, for a subordinate feat of similar quality by Flowerden's squadron of Strathcona's Horse, one of the rare cases in modern war when cavalry have charged through a body of infantry in the open.

After studying the later actions at Rifle Wood we passed on to the more famous battlefield at Villers-Bretonneux, the high-water mark of the German tide of 1918. Once more the ground showed, as no book could, the vital importance of this position, and what a German success on April 24 and 25 would have meant. For from

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Hill 104, just north of the town, the ground falls away to form a long trough of country, at the end of which the cathedral of Amiens is clearly visible. With this high ground and that at Cachy, to the south, in their possession, the German artillery must have dominated this vital rail-centre and link between the Allied Armies. One realised, too, the Germans' folly in thrusting at Villers-Bretonneux itself, entangling their advance amid its gas-filled ruins, instead of at the high ground on either flank. It was equally clear how much the Allied cause owed to Lord Rawlinson's resolution in insisting on a counter-attack that night, and to the Australian troops who carried it out. The French, farther south, who waited until daybreak next morning, lost heavily and regained nothing.

The counter-attack as designed by General Butler, commanding the Third Corps, was not to strike at Villers-Bretonneux direct, but to pinch it out, the two wings effecting a junction beyond the town. It succeeded brilliantly and restored the situation, yet for some time it was a mystery why more of the Germans who had thrust their heads into the noose were not cut off. Later, however, it was discovered that one of the brigade commanders altered the objective according to his own ideas instead of complying with that given him by the higher command. As a result the pincers did not quite meet, and through the narrow gap thus left the Germans dribbled back in small parties during the night. The consequences of his action provide an object-

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lesson in what may be termed the discipline of leadership.

Our study of the action brought out two other points of interest—first, the vital importance, when the counter-attack was made, of the retention of Hill 104 by the 5th Australian Division when the rest of the line was driven back and Villers-Bretonneux was lost, for the temptation was to conform to the rearward movement; second, that whilst this counter-attack restored the situation the credit for saving it on the 24th would seem to be largely due to the Tank Corps. On the first morning the German attack just south of Villers-Bretonneux, towards Cachy, was led by a number of their cumbrous tanks. To meet the danger seven whippet tanks were launched in an oblique counter-attack from between Cachy and l'Abbé Wood. They passed between the German tanks, already disabled by shell fire or our own heavy tanks, and then in a hollow came suddenly upon three German battalions drawn up to deliver a decisive attack.

At point-blank range the whippets fired into the mass and then swept through and over them, running down many who were trying to escape. The whippets came back spattered with blood—and the German attack was nipped in the bud. Twenty-one tankmen against over fifteen hundred infantry—a good record! This episode has also the historical significance that for the first time opposing tank forces met on the field of battle. While the facts were known before, we were

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fortunate in the presence of the actual commander of these tanks to clear up the details.

From Cachy we drove to Corbie, crossing the Somme, and thence just beyond to Richthofen Ridge, overhanging the river, where the famous German "ace" was brought down. From this point of vantage General Montgomery described first the battle of Hamel, across the river, on July 4, 1918, and then the outline of August 8. The first, a brilliant local success by the Australians and the tanks, had far more than a local result, for it revealed to the Fourth Army Command the decline in the German *moral* and the feasibility of a similar stroke on a much larger scale. The plan for this was submitted by Lord Rawlinson before even the Marne counter-stroke marked the turning of the tide. Launched on August 8, it was for Ludendorff "the black day" of the German Army in the history of the war; it convinced him that victory was impossible and that peace must be sought. The secret of its success lay in two main factors—*moral* and surprise. On the one side the moral tonic of Hamel, on the other a moral decline.

As for the consummate skill with which the surprise was achieved, two anecdotes will best illustrate the success of the precautions. Even the War Cabinet in London did not know of what was in the wind, and in that august assembly Mr. Hughes, the Australian Premier, was in course of a speech arguing that the Australians should be taken out of the line when the news arrived that the Australians were far on the other

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side of the line. On the morning of August 8, also, a brigade commander from the neighbouring army called in at Fourth Army Headquarters for an informal chat on his way home on leave, and inquired why there was such a heavy sound of gunfire from the front.

The third day, or rather the second of the tour proper, we set out for Péronne, following the track of the August 8 offensive down the main Brie road, and then turning north to study the Australians' famous exploit in capturing Mont Saint-Quentin. In keeping with the occasion we also had to face hazards in securing a point of vantage. Leaving the cars to climb a low hill, we had progressed some distance from our base when we discovered that we shared the field with a formidable-looking bull. On his approach the party displayed its staff training by a well-conducted withdrawal to the other side of a barbed-wire fence. Not to be outclassed in tactical manœuvres, a herd of inquisitive cows promptly rushed down upon our rear, but General Montgomery discoursed imperturbably, notwithstanding the slight distraction.

When the narrative was completed, the retirement began by the same way, and was executed smoothly, though a belated advance by the bull from the flank almost provided us with the stirring sight of the Adjutant-General in India heading a relief party to rescue General Montgomery, our rear-guard. Therefore we crossed the Somme by Cléry and followed the track of the masterly manœuvre by which the Australians, switching

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troops from the south to the north bank, gained the key-point of Mont Saint-Quentin, so turning the whole river line. For at Péronne the Somme bends south and forms a difficult obstacle to any direct advance.

After lunch in Péronne we resumed our eastward progress, until at Bellenglise we reached the Saint-Quentin Canal and the site of the famous Hindenburg Line. Here the 46th North Midland Division made their historic crossing on September 29, 1918. Beside the rebuilt bridge were still concrete machine-gun emplacements of immense thickness, and as one surveys the breadth of the canal and the bareness of the slopes the idea of crossing seems fantastic. Even with the knowledge that in 1918 the water was low enough in places to be fordable, and that we concentrated one gun to every three yards of front, the achievement can only be explained by the semi-collapse of the Germans' power of resistance by that date.

Both our bombardment and our attack owed part of their effectiveness to one of those strange chances of war which so often have vitally influenced the course of battles. Away back on August 8, our armoured cars, exploiting the confusion behind the German lines, had penetrated as far as Corps Headquarters, surprising the staff at table with a burst of fire through the open window. There were captured a map and complete defence scheme of the Hindenburg Line.

If circumstances aided the feat of the 46th Division, they do not detract from it, solely con-

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verting it from the utterly impossible to the barely possible. It is just to emphasise that during the last two days of September 1918, the purely English Ninth Corps—1st, 6th, 32nd, and 46th Divisions—broke right through the part of the Hindenburg Line strongest by nature, while the Australian and American troops to the north made a far shallower advance. Their line of advance, which we visited next, lay where the canal passes through the six-miles-long Bellicourt tunnel.

We examined the southern end of this engineering work, which was constructed under the orders of the first Napoleon. In it the Germans kept their reserves, in barges, an incomparable shelter from shells, but a handicap in face of a rapid enemy advance. Near by is a monument erected by the "State of Tennessee to the 30th American Division, who broke the Hindenburg Line, September 29, 1918"—a "big parade" assuredly, when the actual facts are considered!

From this point we drove on to Bony and Gillemont Farm, which proved so formidable an obstacle to the advance of the Australian-American corps. The dense rows of crosses in the impressive American cemetery there are a memorial alike to the gallantry and to the inexperience of these American troops, who lost the fruits of their dashing advance by the failure to clear up the ground they had passed over. As at Guillemont in 1916, the Germans showed remarkable skill in utilising the folds in the ground for moving up reserves for counter-attack.

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The fourth day we drove north again to study first the cavalry operations in the advance to Le Cateau—where our Army, after a four years' trench nightmare, had at last fought their way into open country again. In this way we progressed to the crossing of the Selle north and south of Le Cateau, now a narrow rivulet, but then a wider and deeper obstacle owing to the Germans damming the stream. The drive afforded sidelights on the German occupation. In the villages one noticed that all the houses were numbered in black-painted figures. The significance of this was not grasped until one also noticed that the inscription "Keller 25," or some other number, remained on many houses. Then it was realised that these were the old German billeting signs, token of their thorough organisation. Elsewhere one saw the word "Ortkommandantur" still unerased.

After lunching in the Square at Le Cateau, close to the big school where French's headquarters were located during the Battle of Mons, we drove north towards the Belgian frontier by the long, straight *pavé* road down which our weary troops marched with aching feet under a broiling August sun thirteen years ago. Thence, skirting the famous Forêt de Mormal, which caused the unlucky division between the lines of retreat of our two army corps, back to Landrecies, we passed the fork-roads where the 3rd Coldstream Guards fought the celebrated night action which stopped the German attempt to rush the town.

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From Landrecies we drove to the Sambre and Oise Canal, forced by the Fourth Army on November 4, 1918, its last serious fighting before the Armistice. All knew by then that the end of the war was imminent, yet the crossing of this water-barrier witnessed a higher proportion of V.C. actions than any other operation of the war —a supreme testimony to the moral staying power of the English race.

Spending the night again at Saint-Quentin, we returned for our last day to the same ground, but to study 1914 instead of 1918, an apt reminder of the extraordinary coincidence which saw the British Army finishing where it had begun the war. Our subject was the Battle of Le Cateau, where the heroic stand of Smith-Dorrien's Second Corps saved the left wing of the Allied Armies. We halted first on the northern outskirts of Reumont, beside a house where a small copper plate fixed to the wall bore the words :

5th Division
Battle Headquarters,
Le Cateau,
26th August, 1914.

Here were described the moves which led up to Smith-Dorrien's decision to stand and fight, and from the informal discussion emerged one or two vitally interesting sidelights on the inner history of those critical days. How the British Chief of Staff fainted in an inn just before the battle, a collapse which had a bearing on the

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for long inexplicable absence of G.H.Q. control at the crisis and the failure to co-ordinate the movements of the two British corps. How Henry Wilson, by his inimitable sense of humour and a characteristic game " let's pretend," stalled off the disastrous idea of the British Army retiring to " Torres Vedras " lines near the coast, cutting adrift strategically from its allies.

Drizzling rain and mist delayed our study of the Le Cateau battlefield until the afternoon, when we worked across it from east to west. Our first vantage-point was the " Suffolk " memorial, where the Germans ultimately pushed round and overwhelmed our extreme right flank. Incidentally the toll on the memorial conveys a tactical message—that troops who hold a post, however exposed, suffer less than those who attempt a direct reinforcement of a position which is being attacked. Next we paused to note the spot where the heroic resistance of the 2nd K.O.Y.L.I., with their flanks in the air, gained a vital hour's breathing-space for the menaced 5th Division, enabling it to get a clear start before the Germans could pursue.

Thence to the 3rd Division front, where we had with us two of the original officers of the Gordons to tell us in detail how, receiving no orders to retire, they held on until nightfall, when the rest of the British force was far on its way south and German troops filled the intervening villages. By a vivid coincidence they discovered the house in Bertry where two of their officers, reconnoitring, had opened the door to find it full of

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Germans—and fired their revolvers into the astonished crowd. They even found the man and woman, owners of the house, who had been present on that occasion, and a revolver bullet still embedded in the wall. Thence to the front of the 4th Division, covering Haucourt and Esnes, where the German cavalry attempt to turn our left flank and cut off our imagined retreat to the west was foiled. A long drive back followed along the central axis of British advances from 1916 to 1918, until a memorable tour reached its end at Amiens.

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